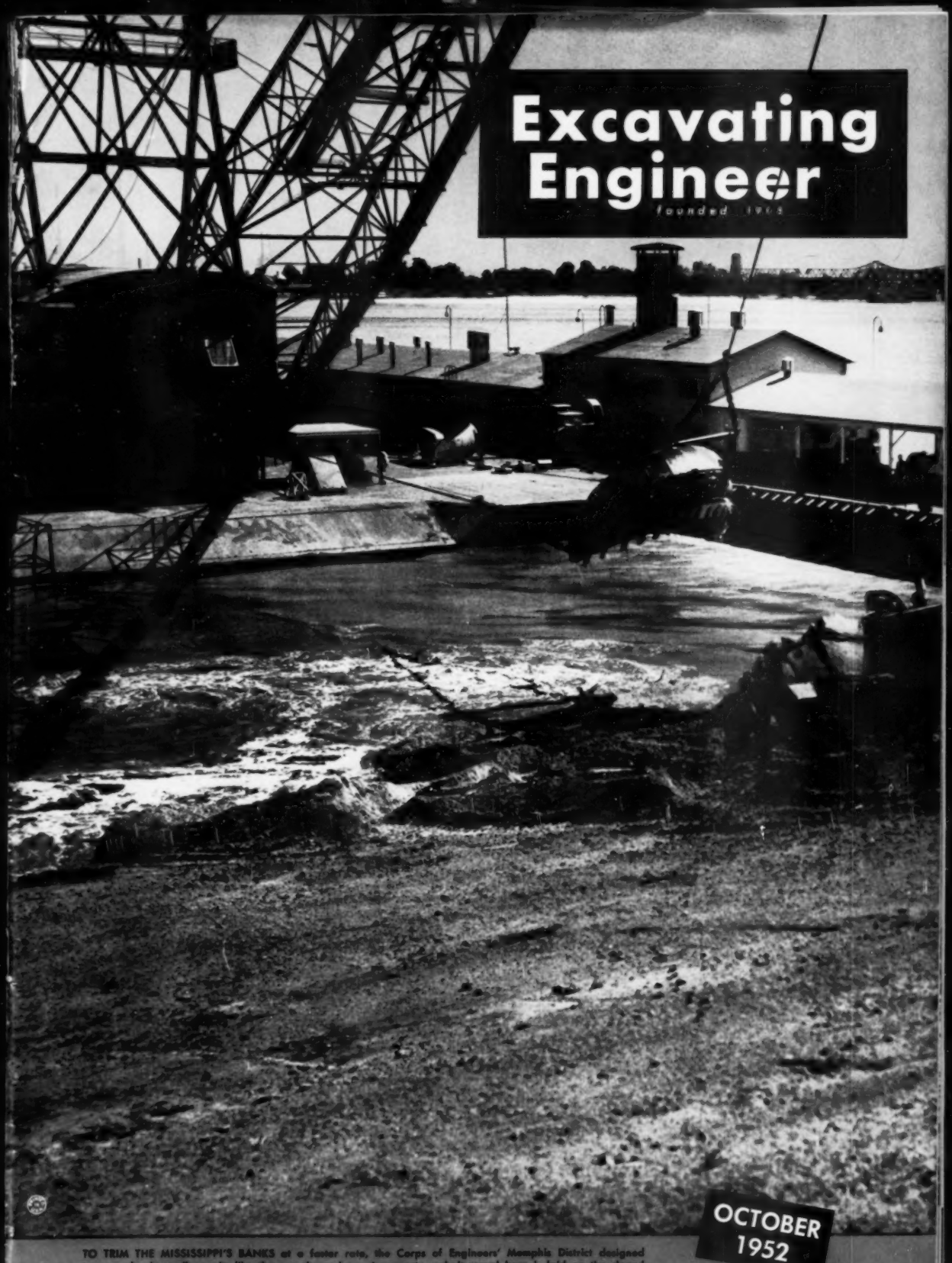


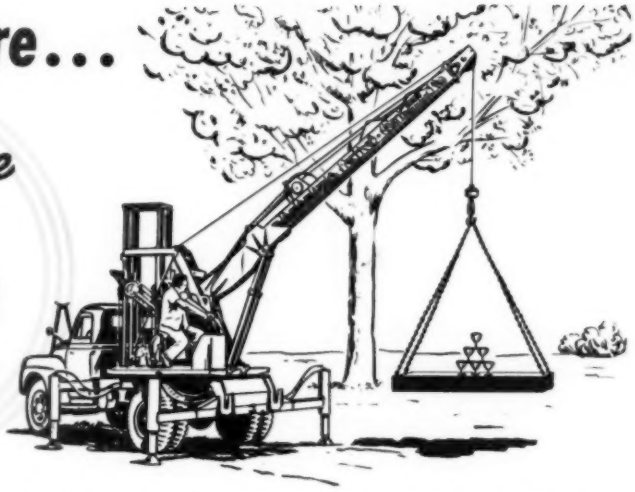
Excavating Engineer

Founded 1911

TO TRIM THE MISSISSIPPI'S BANKS at a faster rate, the Corps of Engineers' Memphis District designed two new bank grading units like the one shown here. A concrete-asphalt-gravel base is laid on the sloped banks to keep the swift current under control. Article on revetment construction begins on page 12.

OCTOBER
1952

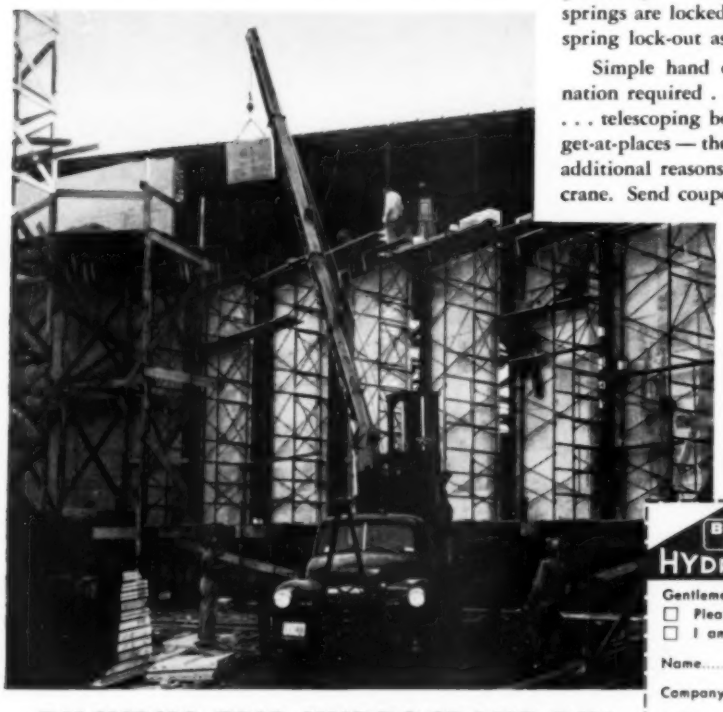
Smooth and Sure... that's *Hydrocrane* PRECISION CONTROL



No matter how carefully you must handle certain building materials — concrete slabs, brittle stone, plate glass windows, concrete buckets— you can handle them with confidence the smooth Hydrocrane way. With every crane function actuated by a liquid-smooth, cushion-action hydraulic system, Hydrocrane control is so precise loads can be moved a fraction of an inch if necessary. In actual tests this machine lifted, swung and set down a pyramid of six full drinking goblets (on a 1-ton steel test slab) without spilling a drop.

And to make this precision control pay off to the fullest extent, the Hydrocrane is equipped with four outriggers that extend in seconds, providing a rock-solid crane foundation. Truck springs are locked out through a semi-automatic spring lock-out assembly.

Simple hand controls, no hand-foot coordination required . . . 50 mph top highway speed . . . telescoping boom for reaching into hard-to-get-at-places — these are just a few of the many additional reasons why your best buy is Hydrocrane. Send coupon now.



Here the Hydrocrane with crane hook hoists a heavy stone slab to an upper story. Crane is available with additional money-making attachments — four hydraulically operated buckets, magnet and grapple plus the HYDROHOE — A DRAGSHOVEL FRONT-END THAT IS QUICKLY, EASILY ATTACHED IN THE FIELD. Ideal for trenching and foundation work.

BUCYRUS-ERIE HYDROCRANE DIV.
South Milwaukee, Wisconsin

BUCYRUS ERIE HYDROCRANE
South Milwaukee Wisconsin

Gentlemen:
- ☐ Please send Hydrocrane literature.
- ☐ I am interested in a demonstration.

Name.....
Company.....
Address.....
City..... State.....

154H52C

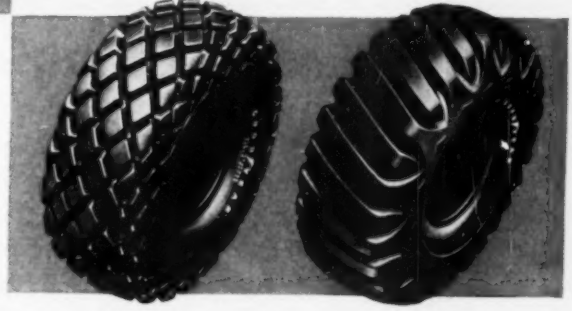
SURE-GRIP

—for good reason!

TAKE a look at the tread design of this great Goodyear work tire and you can see why it's first choice for drive wheels on earth-moving operations everywhere — and why its name is a natural. For the Sure-Grip is the top tire for grip and pull. Its specially engineered O-P-E-N C-E-N-T-E-R tread and massive, balanced lugs provide high-hour traction without equal. *And cost-wise construction men know it.*

Sure-Grip, All-Weather–T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

THERE'S A COST-CUTTING GOODYEAR TIRE FOR EVERY JOB



ALL-WEATHER
Finest for flotation, rolling big loads faster.

HARD ROCK LUG
Super-tough champ for all kinds of rock work.

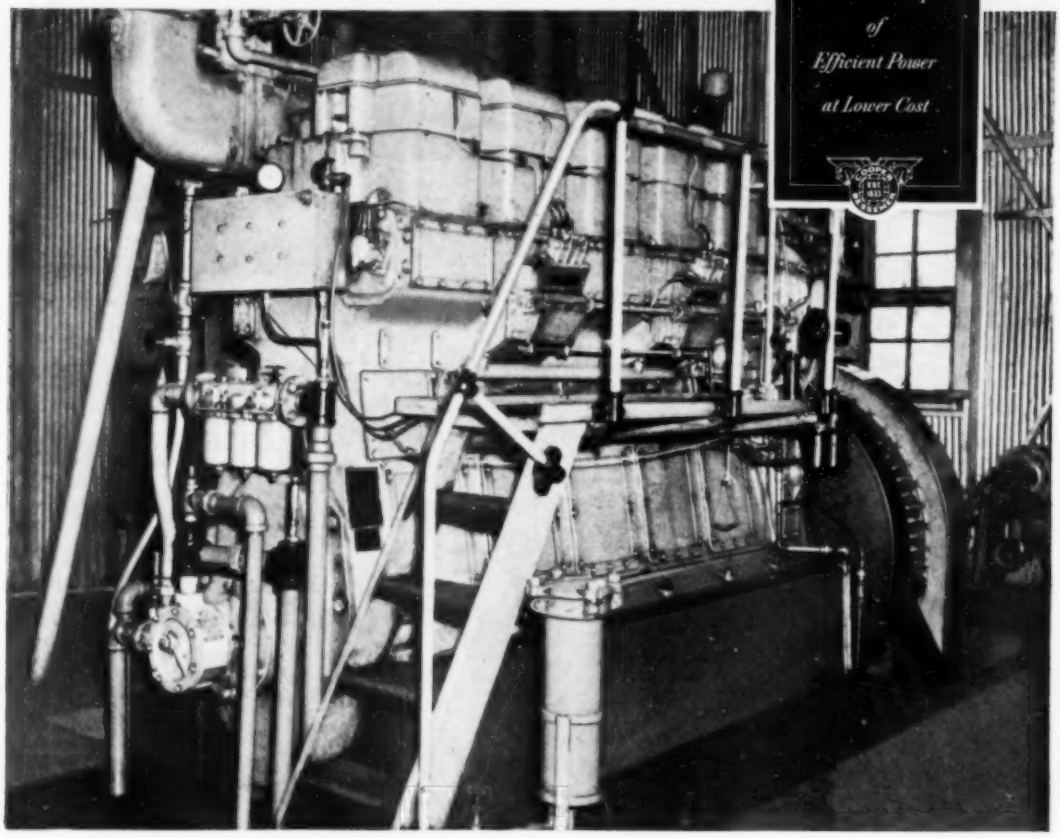
GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

We think you'll like "THE GREATEST STORY EVER TOLD"— Every Sunday — ABC Network

Installed at Uvalde Rock Asphalt Company's quarry, Blewett, Texas, this 430 hp Cooper-Bessemer JS-5 diesel drives a 300 kw generator for general power requirements.

Another Example of Efficient Power at Lower Cost



Steady worker, good at keeping costs DOWN!

THE Uvalde Rock Asphalt Company, which produces about 500,000 tons of limestone rock asphalt a year, needed a diesel that would stand up to steady work month in, month out. And that's just what they have in the Cooper-Bessemer JS-5 shown above. This efficient, husky diesel, installed in 1946, has done a steady job right from its initial start, with a very minimum of attention and replacement parts. Like other Cooper-Bessemer engine types, larger and smaller, the JS consistently shows records of low-cost operation. It has all the Cooper-Bessemer features that pay off every time.

The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

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Excavating Engineer

founded 1905

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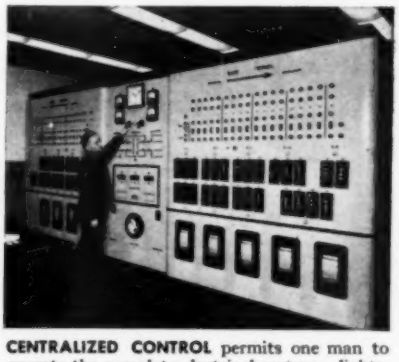
CONTINUOUS-LINE FLUORESCENT LIGHTING—key feature of Brooklyn-Battery electrical system—gives safer, shadowless illumination. Variable light intensity and lower operating costs are other important features.

WELL-LIGHTED APPROACHES lead to tunnel. In daytime, lighting inside the entrance is brighter to provide better transition from sunlight.



CENTRALIZED CONTROL permits one man to operate the complete electrical system—lights, fans, pumps and safety equipment.

Ribbons of light mean safer, lower-cost tunnel operation

Fluorescent lighting, central control, reliable power highlight G-E system at Brooklyn-Battery Tunnel

Now handling 16,000,000 vehicles a year with safety, comfort, and operating economy, New York's Brooklyn-Battery Tunnel provides an excellent example of modern tunnel electrical systems. Designed by engineers of the Triborough Bridge and Tunnel Authority and General Electric, this electrical system was the first to feature economical, variable-intensity fluorescent lighting. Centralized control and a coordinated power distribution system also contribute to operating economy and dependability.

Tunnels are just one of the many types of heavy construction projects on which General Electric is ready to assist your engineers or consultants in electrical system planning. Contact your local G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y.

664-24

RELIABLE POWER—a necessity for tunnels—is provided by G-E metal-clad switchgear. G.E. also builds fan and pump drives for tunnels.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

IT'S THE ROCK JOBS

that prove a Shovel!

Any shovel can dig dirt! But, put it in rock! Get up on a Northwest if you know "operation". Get the feel of the controls. Feel that crowd take a-hold. The dipper goes right on through as the hoist takes it up — no "re-starts" are required here. It's a full load in one cut. Remember the Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste — force that puts greater effectiveness at the dipper lip for handling tougher digging and producing more output.

To Northwest digging power add the "Feather-Touch" Clutch Control which brings ease of operation without the complications of pumps, piping and compressors; the Cushion Clutch that eliminates shock overloads before the damage is done; Uniform Pressure Swing Clutches that cut spotting time by eliminating the jerks and grabs in swinging; Northwest simplicity of design that makes upkeep easy and reduces "down time"; and all the other Northwest advantages that make Northwest a *real* Rock Shovel.

You can plan to have a Northwest. Now is the time to find out about Northwest design and operation. Why not talk it over with a Northwest man?

NORTHWEST ENGINEERING COMPANY
1506 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Allis-Chalmers HD-20 Tractor

gives HIGHER OUTPUT—

Exclusive Hydraulic Torque Converter Drive Is One BIG Reason Why

The hydraulic torque converter drive, *exclusive* in the Allis-Chalmers HD-20 Tractor, brings you productivity, handling ease and dependability that makes every hour, every day of the season count . . . gives the operator the equivalent of hundreds of gear ratios in two speed ranges . . . automatically selects the proper speed for maximum production.

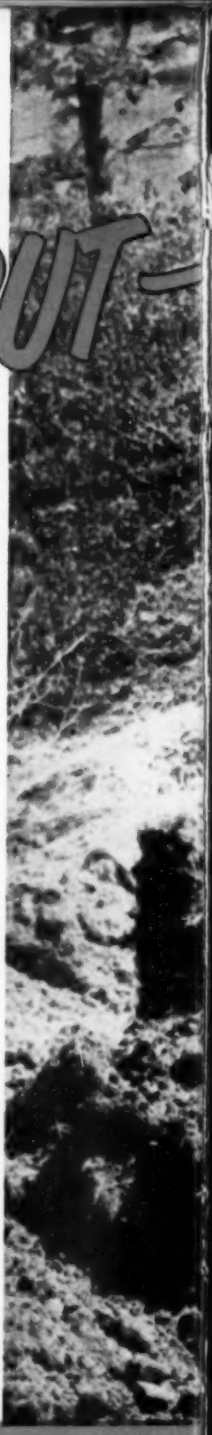
Dozing — With hydraulic torque converter drive you take full advantage of available horsepower . . . roll bigger loads, tackle tougher dozing jobs. Master clutch engages under cushioned protection, yet power is achieved *instantly* with velvet-like smoothness. This means fewer repairs . . . longer life of tractor and auxiliary equipment.

Pulling — There's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

Excavating — With full horsepower available even at creeping speed, and shifting virtually eliminated, the operator can concentrate on his front-end shovel completely . . . crowd surely and steadily . . . start and stop with a touch of the throttle.

Pushing — The HD-20 makes smoother contact, automatically matches speed to pushed equipment, maintains steady contact while loading, sends load off to the fill in a higher speed.

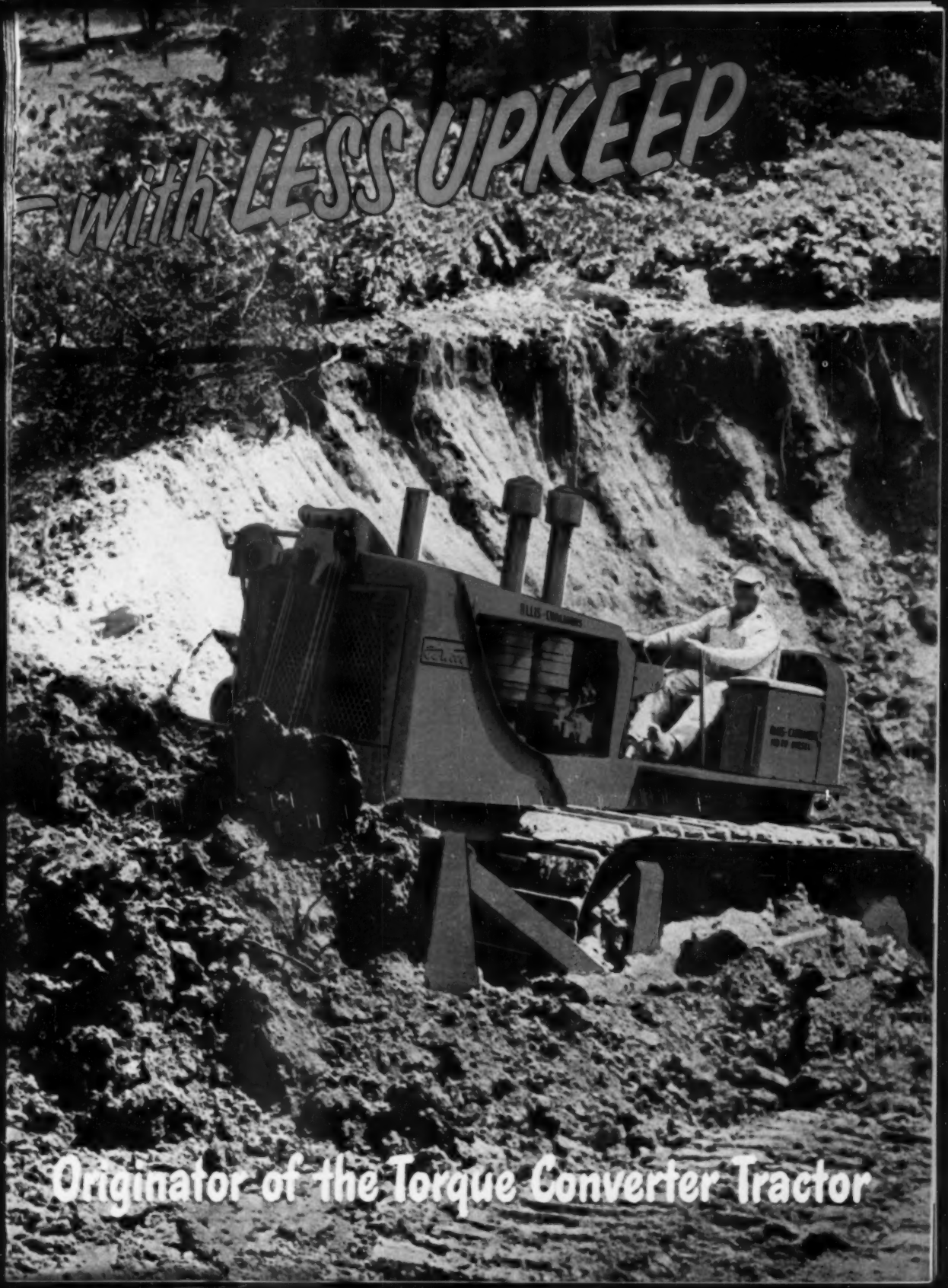
Get the full story now from your Allis-Chalmers dealer. See why the HD-20 does more work, more easily, at less cost . . . and why it is worth waiting for.



ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Weight: 41,000 lb.
175 Net hp.
at flywheel


with LESS UPKEEP
Originator of the Torque Converter Tractor

Can your bottom-dumps match these

1 **2-wheel prime-mover** — Eliminates drag of extra steering wheels, uses full front-end weight for traction. Makes rig easy to spot, turn. Because tractive effort is always *in direction steered*, rig climbs easily out of ruts, over stones or roots, etc.

2 **Tires 7′ tall, 2′ wide** — Big wide-faced tires "float" machine over soft going . . . flex to unload mud, have no split of duals to fill and chafe. Big diameter "flattens" the pull . . . gives better, more direct traction for soft going, rolls smoothly over rocks and logs. Large, flexible low-pressure air chambers absorb vibration, increase life of tires and machinery. Double grip with tapered bead reduces rim chafe, improves recap service. Wide treads give better compaction on fill, reduce rutting and digging-in on haul roads.

3 **Power-proportioning differential** — Transmits up to 4 times the power to wheel on firmer footing . . . keeps rig rolling on slippery footing, pulls through soft silt and mud-holes, keeps haul roads in better condition by reducing "cutting" of spinning wheels. Eases pull over bumps, stones, roots, curves . . . reduces gear-shift slowdown, weather interruptions — gives you a longer season, with every operator a top producer.

4 **90° positive-power turns** — Push-button steering, full power operated. Easy, safe — learned in minutes. Maneuvering ease increases cycle speed, gives short 90° turning radius. "Walks" machine out of holes, soft spots. Simple, fully-enclosed mechanism . . . eliminates many wearing parts.

5 **Easy-loading, fast-dumping bowl** — Hopper-type body gives fast loading with minimum spill . . . bottom opening same size as top to dump boulders, stumps. Self-cleaning clam-action doors . . . high-clearance body and high-lift doors for easy turnout over windrows. Cable-operated doors have electric winch power up and down.Cubical shape and short doors give maximum strength with minimum weight. Positive, reliable operation . . . less maintenance.

6 **Less maintenance, fewer parts** — No extra steering wheels, all 4 wheels interchangeable . . . one spare tire services several units. You have no hydraulics, no steering mechanism with its hinges, ball-joints, reach rods, etc. There are no springs to lubricate or maintain. All gearing is enclosed in oil . . . all high-speed shafts ride on anti-friction bearings. Daily checking and oiling takes about 15 minutes . . . general lubrication (needed only every 10 shifts) requires less than 2 hours.

7 **Diesel-electric power, electric controls** — AC generator is a part of engine flywheel, activating brushless motors at point of action. Finger-tip controls through simple, foolproof electric switches. Power transmitted through heavily insulated electric cables — no stress, wear, leakage, delay. Weatherproof motors are not affected by weather conditions. System cuts lubrication, maintenance time.

8 **2 transmission types** — Your choice of transmission. *Sliding Gear* — simple, reliable heavy-duty type, 8 speeds forward, 2 reverse. *Tournamatic constant-mesh PLUS torque converter* — automatic selection of speed ratio needed to balance load and torque . . . single phase, low-pressure converter.

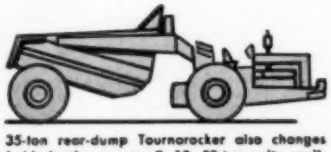
9 **8,467 sq. in. brake surface** — Disc-type air brakes give more braking power per wheel than most other units have on all 4 wheels. Gives safe control in any weather . . . powerful, uniform, smooth acting. Instant response permits higher speed cycles, faster spotting. Tire wear reduced by smooth, equalized braking . . . optional "Electrotarder" further increases braking and heats body for winter.

10 **Operating ease reduces fatigue** — Effortless push-button controls, springy air-foam cushion seat, all-round visibility all mean less strain for operator . . . less risk of careless accidents. Power steer, air brakes, low-pressure tires absorb shocks. No "pulsing" of spring mounting, no steering wheels or heavy manual levers to "fight", no end-of-shift slowdown.

R.G. LeTOURNEAU LET EQUIPMENT

Interchangeable units

Hopper body quickly interchanges with 27½-yd. scraper, using same controls. 7, 16, 42-yd. scrapers available with other units.

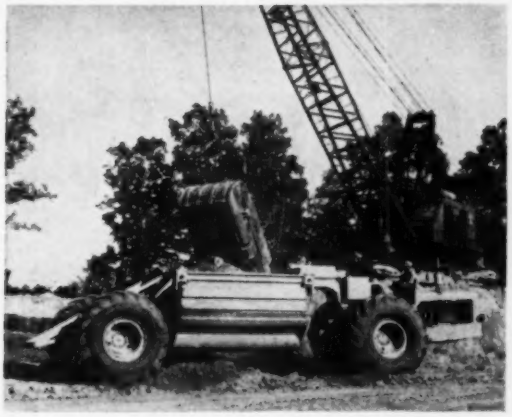


35-ton rear-dump Tournarocker also changes behind prime-mover. 9, 18, 30-ton units available with other size prime-movers.

advantages of TOURNAHOPPER?

"A" TOURNAHOPPER

- 27-yd. capacity
- 275 h.p., 27x33 tires
- speeds to 39 m.p.h.
- Smaller and larger Tournahoppers available

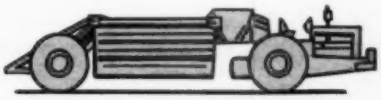


"Tournahopper is the hauling unit of the future," says one owner. On this project, rig hauled 26 bank yard loads up 6% grade on 2½-mile cycle.

11 Interchangeable work units, choice of sizes— Hopper body quickly interchanges with scraper, rear-dump, crane, flat-bed. These additional trailing units available for about ¼ of cost of total unit. All units operate from same prime-mover, using same electric-control system, same brakes, wheels. This gives you continuous application throughout any type job. You work and earn with this equipment on any future project.

Tournarocker, Tournahopper, Tournamatic—Trademark Reg. U. S. Pat. Off. H-223-G

Sizes to fit



In addition to 27-yd. "A" Tournahopper shown, an 18-yd., 186 h.p. "C" unit is available with choice of automatic or manual shift.

R. G. LeTOURNEAU, INC.

Peoria, Illinois

The Percentages Work For You

With Bucyrus-Erie Blast Hole Drills

50% SAVINGS IN PREPARATION COSTS (based on actual user reports). With Bucyrus-Erie rigs drilling larger (up to 12-in.) holes, fewer holes are needed, and these are widely spaced . . . fragmentation is more uniform and less secondary blasting is needed.

30% TO 50% FASTER TOOL CHANGING with a built-in tool wrench offered as standard equipment on the 27-T, 29-T and 42-T. Hand-operated on the 27-T and 29-T, power driven on the 42-T, the tool wrench is an important safety feature.

15% FASTER LEVELING. Users report a time saving of as much as 15% with hydraulic leveling jacks (standard equipment on 42-T, optional at extra cost on 29-T). The hydraulic jack eliminates elaborate ground preparation, blocking and cribbing.

And with rubber shock absorbers in the derrick head and rubber cushioned sheaves, Bucyrus-Erie drills provide that extra rock shattering snap that greatly speeds hole footage . . . reduces stress and jarring to the drill and derrick frame. Yes, the percentages work for you from every angle — speed, lower drilling cost, better fragmentation, lower drill upkeep cost — when you use a Bucyrus-Erie Blast Hole Drill. 46851C

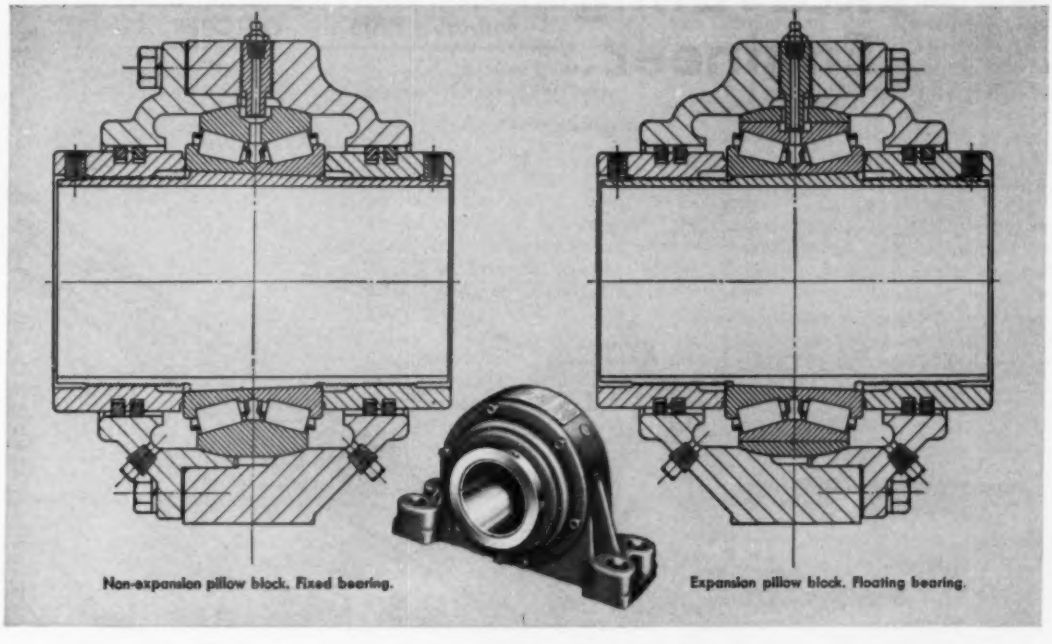
FOUR MODELS

22-T	5⅝"	to 6⅛"	holes
27-T	6"	to 6⅛"	holes
29-T	6"	to 9"	holes
42-T	9"	to 12"	holes

Gasoline or electric power is available for all machines . . . diesel for all except the 22-T.

BUCYRUS ERIE SOUTH MILWAUKEE, WISCONSIN

NEW TIMKEN® BEARING PILLOW BLOCK



First application of new tapered bore TIMKEN® bearing makes new Dodge-Timken pillow block more compact

IT takes up less space. It weighs less. Yet the new Dodge-Timken® All-Steel pillow block has tremendous load-carrying capacity.

It's the result of the combined achievements of the Dodge Manufacturing Corporation, Mishawaka, Indiana, and The Timken Roller Bearing Company and makes use of an entirely new Timken bearing. Never before has a self-aligning, non-adjustable tapered roller bearing with tapered bore been used in pillow blocks.

Being of all-steel construction, this new Dodge-Timken pillow block is more compact and fills a real need where space is a factor. It is available in both expansion and non-expansion designs. And it incorporates all the advantages of Timken tapered roller bearings.

Because of their tapered construction, Timken bearings take radial and thrust loads in any combination. Line contact between rollers and races gives Timken bearings load-carrying capacity to spare. Timken bearings are made of the finest steel ever developed for tapered roller bearings—Timken fine alloy steel—and under normal conditions will last the life of the machinery with which the pillow blocks are used.

When you install new Dodge-Timken pillow blocks, you can expect dependable performance because the bearings are the best. No other bearing can give you all the advantages you get with Timken bearings. Specify them for all your other machinery, too. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means: its bearings are the best.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION

Excavating Engineer

founded 1905 · OCTOBER, 1952

Ole Miss Dons Her Armor

Bank caving dumps a billion and more cubic yards of silt into the Mississippi river each year. To reduce this hazard to levees and the channel, Corps of Engineers' crews hard-surface the banks. Here's how they armor plate Ole Miss.

ONE hundred and seventy-seven years ago when General Washington urged creation of the Corps of Engineers, he heard the skeptics protest. They claimed no American officer "knew the difference between a chevaux-de-frise (field fortification) and a cabbage garden." Ignoring critics, the Continental Congress respected the general's wishes. On the eve of Bunker Hill—June 16, 1775—it authorized appointment of a chief engineer and two assistants.

The Massachusetts colonel who became first chief at $60 a month found his work ready. And he executed it with the skill which has been a Corps hallmark ever since. He began by throwing up defenses at the hill. He

continued by throwing down his shovel and joining the historic fight that followed.

From scratch, the Corps has spent almost more time with shovel than with gun. Early in its life, the Corps was handed certain peacetime jobs by Congress. These duties became in time the biggest business of the body.

Shape Up Waterways

Foremost among the Corps' non-war jobs is handling large flood projects and river and harbor improvements. To the present, it has developed the world's greatest inland waterways system. The network includes 28,000 miles of navigable channel, 270 harbors and 490 locks and dams.

The most prominent artery the Corps maintains is the Mississippi river. It drains a watershed of 1¼ million square miles—41% of total U. S. land. With tributaries and canals, it provides over 4,000 miles of 9-ft. and 1,300 miles of 12-ft. channel.

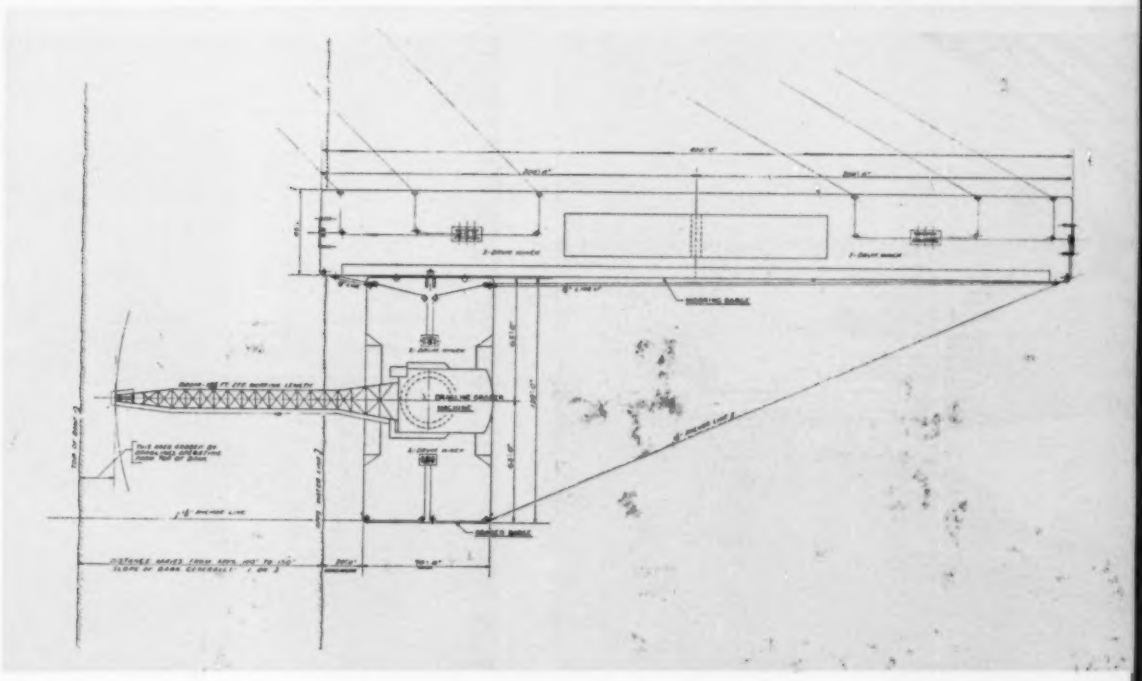
Spotted at the system's hub is the Memphis, Tenn., district office. Within its orbit lie hundreds of miles of channel fanning out to mid-west industrial centers from Minnesota to Texas. The Memphis district takes care of the Mississippi from below Cape Girardeau, Mo., to the mouth of the White river near Rosedale, Miss. The lower channel of the White river from Georgetown, Ark., to its mouth is under Memphis jurisdiction. In its territory also is the St. Francis river from Fredericktown, Mo., to the mouth at Helena, Ark. Along the Mississippi's east bank, the district watches over tributaries from the Ohio river to Nonconah creek at Memphis.

On all these, the district takes responsibility for flood control. On the tributaries, it does a share of clean-out work. On the Mississippi itself, the district maintains a navigable channel. This it must keep 9 feet deep and 300 feet wide at any stage of the river.

Four-Way Control

Memphis district engineers use four main structures to control the river and preserve its depth. They build levees which restrain the water at high stage. They erect dams which harness the upstart river and turn it to man's benefit. They dig cut-offs which shorten

• Left: Bank Grader 4918 — a barge-mounted Bucyrus-Erie 9-W dragline — pulls dirt into Mississippi river. Winches move barge towards center of river as 1:3 slope is carried outward. Note barge's chamfered middle section which accommodates drag cable. At bank top, International TD-24 crawler with Bucyrus-Erie bulldozer and Northwest dragline trim cut. Below: Drawing shows grader and mooring barge set-up.



the channel length needing maintenance. They build revetments which check bank caving.

The last of these—revetments—are less eye catching than the big levees set back from the river's edge. But they are every bit as important. Their construction requires plant and know-how which pay credit to the country's oldest engineering organization.

Hang a coat of armor on the river bank and you have a revetment. It shields the bank from the 2 to 8-mph Mississippi current. The hard cover prevents undercutting which gnaws at expensive levees. The revetment also stops erosion with its washed-down silt, sand and loam which catches on shoals. Although studies show that silt build-up does not reduce channel depth, nevertheless it should be avoided if the channel is to be stabilized.

• At Miller Bend, Miss., caving bank shows effect of undercutting before revetments were applied. *Corps of Engineers photo.*

Extent of Caving

A 1942 study stressed the need for revetment construction along the Mississippi's banks. Engineers evaluated bank caving on the lower part of the river for the 1931-1941 period. The report covered the 770 miles from Cairo, Ill., to Angola, La. The average annual caving along this distance amounted to approximately 800 million cubic yards.

Today more than ever, it is in the best interests of the United States to reduce this caving, and to develop and stabilize the channel. For the Mississippi is in its heyday as a freight transporter. Never in the romantic era of the paddle wheel did the ton-mile volume approach the present load.

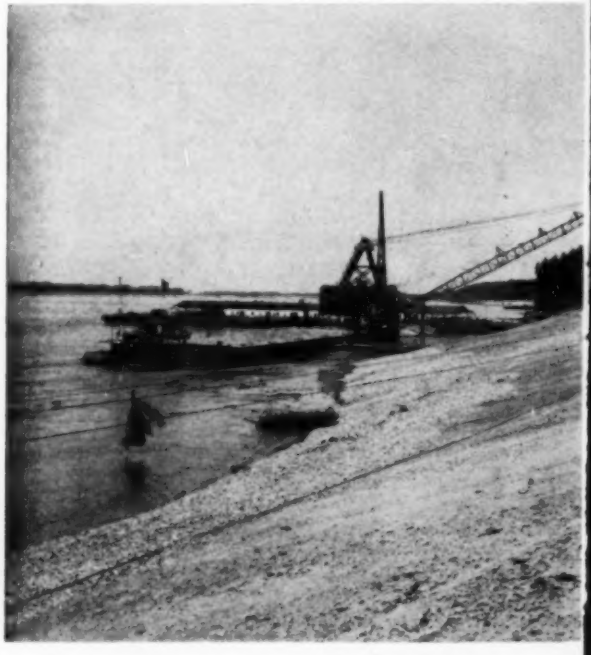
Traffic Hits Record

Traffic on the country's No. 1 water highway rose from 5.5 billion ton-miles in 1931 to 14 billion ton-miles in 1940 and attained a record 36 billion ton-miles in 1951. A hefty 66% of all the U. S. river and canal traffic plies the Mississippi and its tributaries.

Two major plants are involved in revetment construction. First, a bank grading party makes a pass at the bank which is often already undermined. The crew of men and machines cuts a smooth slope from bank top, above water, to channel depth, under water. Next, a sinking crew lays concrete mattress on the slope from water line to channel depth. Thousands of cast concrete blocks held together with wire make up the articulated mattress. A rip-rap or asphalt blanket ties into the concrete at water line and covers the bank from there on up.

Big Job: Big Crew

Simple as the two-step procedure sounds, it is a big-yardage excavation and concrete job. Both grading and



• Below left: Bulldozer-equipped International TD-24 tractor fine grades top of bank. Special Sauerman crescent dragline bucket can be seen here. *Corps of Engineers photo.* Below right: Grader unit changes eroded bank to smooth slope. Next clamshell on barge takes gravel from supply barge and places blanket along lower bank.

mattress laying need big machines manned by big crews.

A 450-man organization runs the mat plant while 250 men handle the grading assignment. One of the revetment builders' serious problems in the past has been getting enough bank graded to keep the mat plant busy. When lack of work idled the mat crew, men were laid off for short periods. By experience, these workers became specialists in a type of work found nowhere else. It was impossible to replace them with equally-skilled men. Yet after each lay-off a percentage of the mat crew never returned.

The Corps of Engineers' Memphis district believes it has solved this problem for a long time to come with two new bank-grading machines put into use last year. The graders turned out so much slope in their first season that they were shut down for a week while the mat plant caught up.

Except for the draglines, the bank graders were designed by the Mechanical and Electric Section of the Memphis district. Around the yard, they are known as B. G. 4918 and 4919. Each unit is a self-sufficient machine composed of two barges hitched together by a system of cables and tracks. The long, thin mooring barge measures 45 x 400 x 9 feet. With one end attached to the bank it juts into the river like a steel pier. The grader barge, with 900 square feet less deck area than its sister barge, measures 70 x 130 x 9 feet. Mounted in the center of the deck is a Bucyrus-Erie 9-W walking dragline minus eccentric cams, track frame and walking shoes.

Two-Barge Team

Fitted along the mooring barge's side is a trackway which serves as path for a trolley secured to the grader barge. By this means the grader barge may be moved the full length of the mooring barge as the bank slope is carried out into the river. Grading may be continued as far as 300 feet from shore and as much as 30 feet below water surface.

An unusual set of castings went into the construction of the trough or runner on the trackway structure. Almost the entire length of the mooring barge was spanned in only six castings. The General Steel Casting Co., Granite City, Ill., cast the trough in six casts, each 50 feet long.

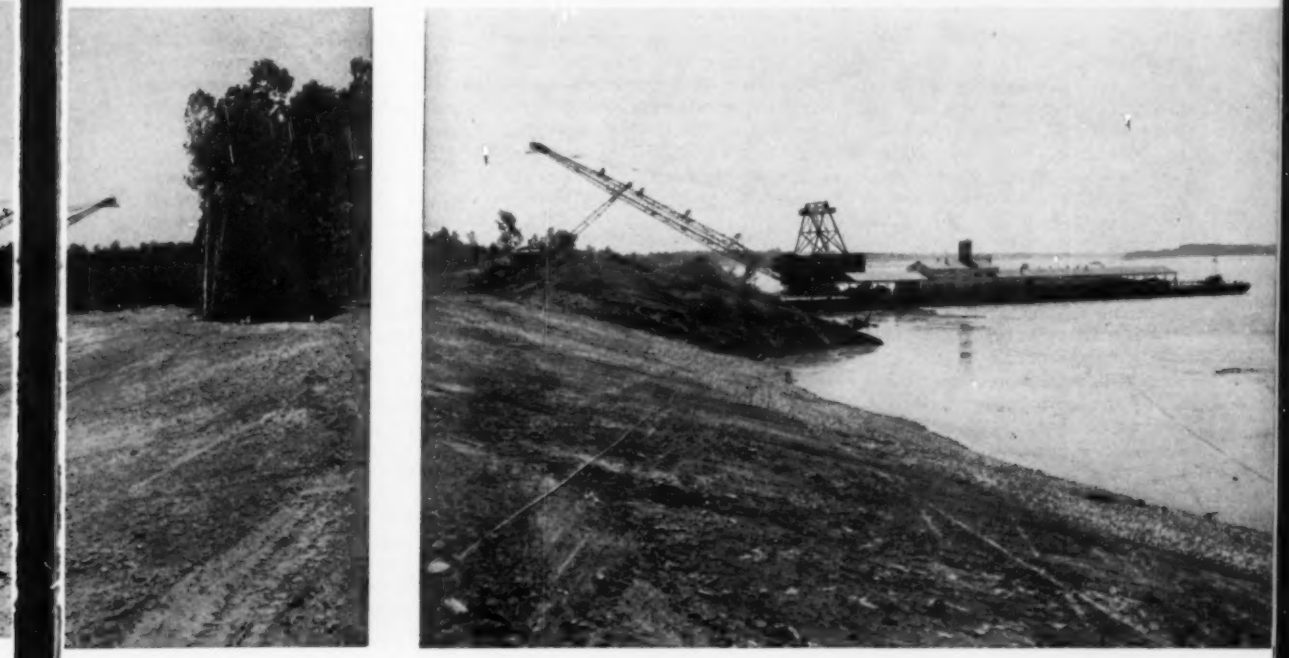
Motive power to shuttle the grader barge back and forth in its track comes from two 2-drum winches. They are deck-mounted at either side of the dragline. Both transmit power through 1⅛-in. wire rope and bear ratings of 18,000 pounds of line pull at 80 fpm. The inboard winch lines pull through sheaves attached to the ends of the moorings barge and deadened at the two inboard corners of the grader barge. The outboard winch lines pull against two deadends, one at the end of the mooring barge and the other on the bank to an anchorage point. To move the grader barge, winch men operated both 2-drum winches simultaneously. One drum on each winch must be paid out while the other is reeled in.

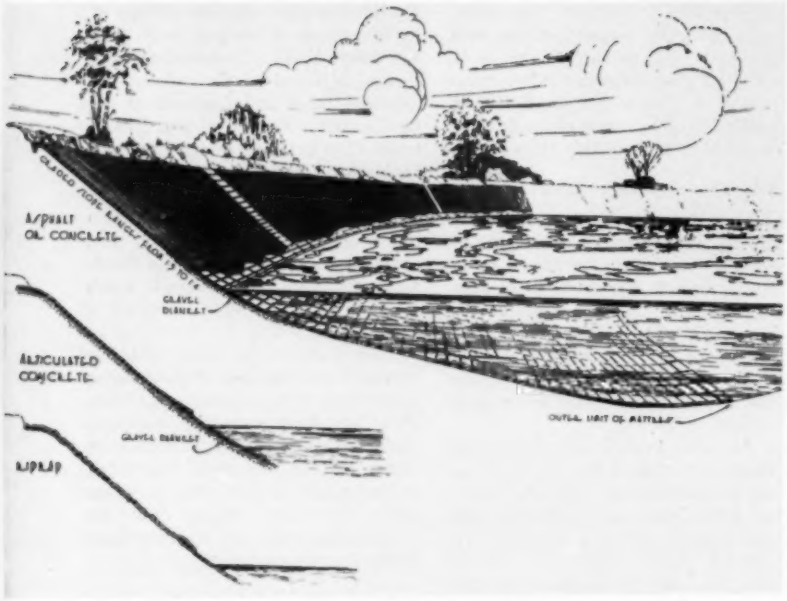
Two 3-drum, 3-motor winches mounted near the ends of the mooring barge hold it fast against the bank. They are direct-connected, magnetic-brake winches without frictions or clutches. They can exert 30,000 lbs. of line pull at 28 fpm through 1⅛-in. cable. Six lines issuing from the winches deadend on the stretch of bank which is not being graded.

Largest Draglines Afloat

The Bucyrus-Erie 9-W machines surmounting the grader barges are the largest draglines ever to be mounted on floating equipment. The Ward-Leonard control machines also rate the

● Note winch lines leading to long, narrow mooring barge. Three Diesel generating sets in "mother barge" furnish electric power for operation. The 183-ft. boom on the Bucyrus-Erie 9-W dragline is secured at a fixed angle.





● Sketch shows essential features of revetments which stop bank caving, thus saving levees and stabilizing the river for flood control and navigation.

distinction of being the first Diesel-electric draglines built for the Corps of Engineers.

Each of the 9-W's carries a 183-ft. boom which includes a 20-ft. insert. The short section may be removed to bring the boom back to a 163-ft. length. Swung on the boom is a specially-designed Sauerman crescent bucket capable of moving 15 yards of material on each cast. A bottomless bucket, it stands 6 feet high at the rear and measures 14 feet in width which is 4 feet wider than the manufacturer's standard model. The 13,300-lb. bucket does not lift the dirt and dump it. Instead, it pulls the load down the bank cutting a stable, evenly-aligned slope. Material brought down in the bucket is discharged in the river where current moves it away. If subaqueous slope is not satisfactory, grading must be extended below water line.

A 1¾-in. wire rope serves as drag cable while the hoist cable, necessary to return the bucket for another cycle, is 1½ inches in diameter. The loaded bucket may be pulled down the bank at a 350 fpm rate. The empty bucket can be hoisted and returned at the rate of 600 fpm. A full cycle consumes only 45 seconds.

Since the grading objective is a fixed bank of 1:3 to 1:4, the job is handled nicely through a system of balanced reeving on the dragline. Pay out and drag speeds are established in fixed ratio to bring the bucket down at a fixed angle. The boom itself remains at a fixed angle, held there by a safety cable. To pass the grader barge under bridges, the boom must be lowered.

The 400-ton dragline sits on a 9-ft. high circular foundation centered on the grader barge deck. The barge itself is of all-steel welded construction with watertight compartments to reduce the possibility of sinking. Middle sections of the 130-ft. hull sides are chamfered to accommodate the cable when the bucket is dragged close to the barge.

Make Operators Happy

Corps of Engineers' operators find the controls a pleasant contrast with the system of large levers found on older, steam-operated graders. In the glass-enclosed cab, they deal with four small finger-operated levers hardly larger than a wall switch, two small upright levers and two foot-operated brake pedals. All operations from starting the machinery through lifting the bucket, drawing it down the bank, and swinging the machine are controlled from these simple switches and levers.

The mooring barge serves as "mother ship" to the grader barge. Within its superstructure are three Diesel generating units. A 955-hp. American Locomotive Diesel engine drives the main generator. This combination develops enough current to operate all machinery including the dragline. It delivers 750 kva at 4,160 volts alternating current. An auxiliary Caterpillar Diesel-driven generator furnishes 250 kva at 440 volts when the grading machine is idle. For week-end and stand-by duty, there is a Cummins-driven generator capable of producing 37½ kva at 440 volts. It supplies current for lighting and refrigerating equipment. The three generators and all electrical equipment are General Electric products.

Diesel fuel for the engines is stored in two hull compartments. Each holds 7,500 gallons and the total storage capacity will last about two weeks.

Reel Moves with Grader

One of the problems in designing the two-barge grading unit was to devise a method of handling the cable which transfers current from the mooring barge to the grader barge. While the latter moves back and forth in its work, the cable must travel with it. Corps engineers solved the problem with an ingenious ramp and reel scheme. Mounted on the grader barge is an 8-ft. diameter reel which spools in the cable or pays it out, depending on the position of the barge. An 18-in. wide ramp spans the length of the mooring barge. Cable which is let out of the reel lies in the ramp. On the ramp are sides which prevent the cable from sliding off. Thus the grader barge may be moved at will without entangling the feed cable. On the grader barge, voltage is stepped down to operating levels of equipment.

Power tools in the mooring barge machine shop enable crew members to undertake many repairs on the revetment construction site. Available equipment includes a lathe, shaper, forge, drill press, power saw and 300-amp Westinghouse welder.

Bulldozer-equipped Caterpillar and International crawlers sometimes help build the bank grade. They assist in pushing material towards the river and in cutting a more finished grade. An 18-ft. wide by 13-ft. long finishing drag pulled over the surface establishes the fine grade. The 9-W itself can cut a finished grade with the crescent bucket but Corps planners consider this a waste of time. They feel it is more efficient to keep the big machine busy digging the rough grade. Still in the future and still in the minds of

• Here a sinking party applies articulated concrete mattress to graded bank. Cast concrete units are barged down river to construction site. Set inland is one of the expensive levees which border much of the Mississippi. *Corps of Engineers photo.*

Corps of engineers is a new-type crescent bucket which will let the 9-W cut right down to finished grade without taking any more time than it does now.

First Year's Output

The revetment work season as well as the quantity built each year largely depends on Congress. Crews start constructing the bank shielding when money is appropriated, usually about July 1. Work continues until the fund is exhausted. An average year's production consists of approximately 12 miles of revetment.

B. G. 4918 and 4919 made their debut during the 1951 season. From Sept. 1 to Dec 1, the machines graded 50,000 lineal feet of bank in the Memphis district. In addition, the units were loaned to the Vicksburg, Miss., district where they worked for one month.

Corps engineers claim the bank graders could slope 50,000 feet in two months of steady application. Usually that is not possible because the assignment does not run along continuous shoreline. Moves to new sites cut down the machines' output. Once underway, the graders work a 20-hour day. Floodlights are sometimes necessary to keep this schedule.

The St. Louis Shipbuilding and Steel Co., St. Louis, Mo., fabricated the four barges. Erecting the graders on the barges was handled by S. Griffin Wise Co., Mt. Vernon, N. Y., in Wolf river harbor in Memphis.

Cast Wire-Joined Blocks

Corps crews line the subaqueous slope with precast articulated concrete mattresses. Each "square" covers 100 sq. ft. of area in a 25-ft. long by 4-ft. wide pattern. This unit contains 20 individual blocks 3 ft. 10¼-in. long, 14-in. wide and 3-in. thick. These blocks are joined by three 25-ft. plus lengths of 3/16-in. copperweld or stainless steel wire cast in place at mid-depth in the blocks. The structure resembles a Venetian blind in closed position.

Cast transversely through each block are extra reinforcing wires. Both longitudinal and transverse wires protrude from the squares so they may be hitched to squares at either end and either side. With a 1-in. space between blocks and squares, this provision gives the articulated quality to the mattress.

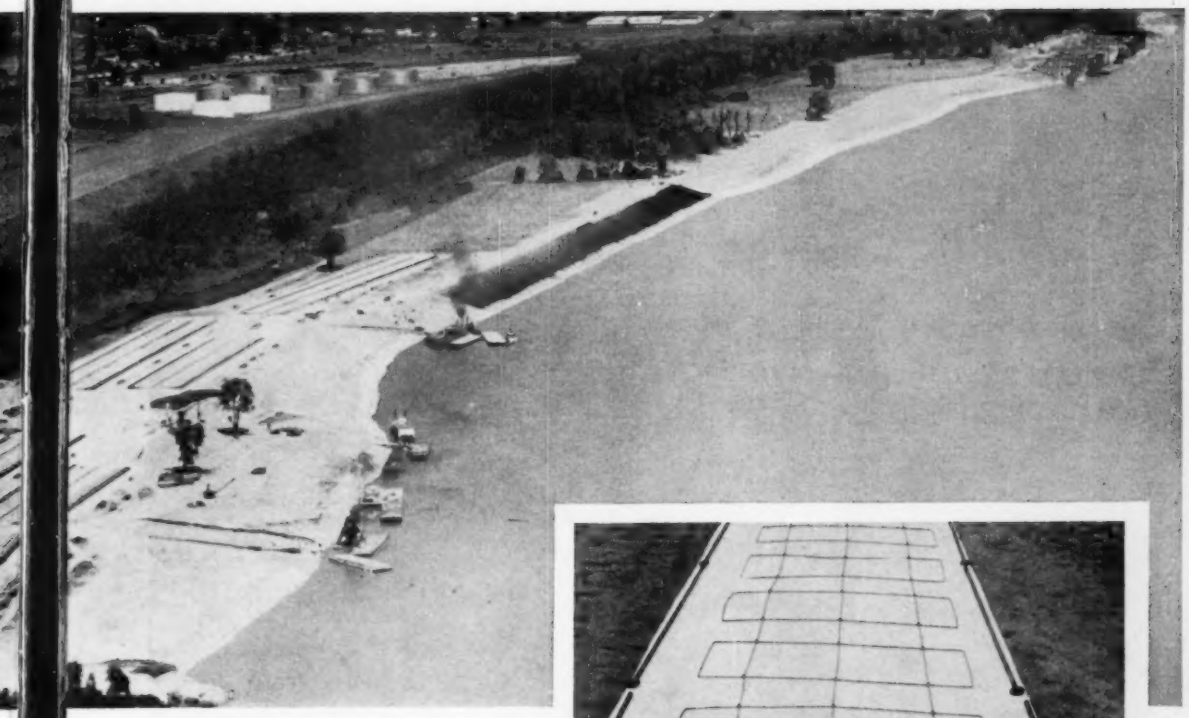
Squares are cast as a unit and each holds .838 cubic yards of concrete. The Memphis district maintains four casting fields along the Mississippi's banks, two on each side. To take advantage of the current, the engineers spot the casting plants up-river from proposed construction sites. Barge tows float the finished mattresses to the job.

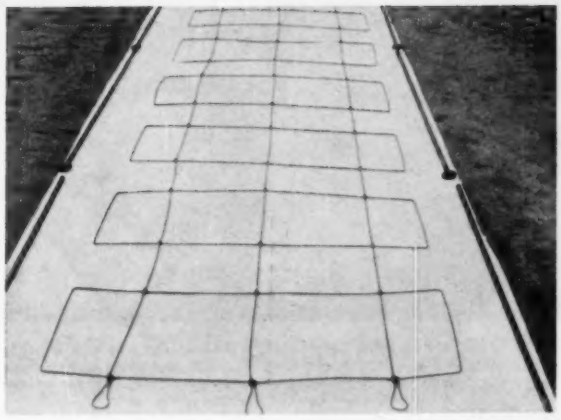
Although the plant lies on government land, the casting itself is usually sub-contracted to private contractors. Steel forms and the reinforcing fabric are supplied by the district. This is a holdover from the days when the district did all its own casting.

Barge in Supplies

To bring raw materials to the casting field, contractors call on the economical barge transportation which their work for the Corps of Engineers helps promote. Cement comes down from the Portland Cement Co., St.

• Mattresses are tied together on sinking barge and dropped off side as barge moves toward midstream. Two cranes transfer mats from haul barges. Mat in foreground joins mat on barge underwater. *Corps of Engineers photo.*





● Above: At Helena, Ark., a typical casting field turns out concrete mattress units. Usually blocks cast this year will be sunk next year. Just above plant a short section of revetment is being placed. Crews pave slope with asphalt. Thin white line at water's edge is connecting mattress. Right: Wire reinforcing is cast into mattresses in this pattern. Loops at end tie into next set of cast blocks. *Corps of Engineers photos.*

Louis, on barges, Miscellaneous items, such as reinforcing wire, reach the field by barge. Even the sand and gravel which are dredged from the river come to the plant in tows. A contractor's pump draws water from the river to supply the mixers.

The contractor sprays forms with form oil before casting. Two or more 34E pavers keep special shop-built hopper trucks filled with concrete. These travel along the rows of forms while workmen control the chute which feeds concrete. A wheeled tractor-mounted vibrator pursues the pour trucks assuring a tight pack. Workmen finally strike off the top of the concrete with wood floats and shovels.

About 1½ to 2½ hours later, depending on weather, forms are stripped. A layer of kraft paper is spread on the curing concrete and when it has set firmly, it becomes the platform for the next lift of forms. Contractors build the lifts as much as 12 squares high. Crews clean and oil the forms immediately after they have been removed. At a typical casting field, generous yardage of canvas tarpaulin is one of the contractor's most valuable tools. A sudden downpour can ruin a lot of fresh concrete.

Ample storage capacity is a requirement in locating the fields. The practice is to cast the squares a year ahead of time. Thus the squares made last year will be laid in the river this year. In an average year's output, the Corps will have some 400,000 squares cast. This amount of mattress will cover approximately 40 million square feet of underwater river bank.

Floating Sinking Plant

The sinking plant which assembles and places the mattress in the river is a two-barge team much like the grader unit. A "mother barge," long and narrow, extends from shore into the river. It houses the generators, fuel supply, shops, etc., which keep the operation going. Along one side is a trackway which guides the sinking barge back and forth as the mat is carried from shoreline to the deep part of the channel.

Deck Slopes Toward Water

The sinking barge superdeck slopes toward the inshore gunwale and ends in a smooth curve over the gunwale. Double trains of rollers are spaced in parallel lines across this deck. They incline toward the gunwale curve and each pair of rollers can support one mattress unit or square.

Behind the slanted deck are mounted two revolving cranes with exceptionally fast cycle speeds. The cranes

● Here is the first launch of a new mattress. Wire ends will be anchored in bank. Crews will assemble another mattress section on inclined deck and join it to section ready for launching. Fast-swinging cranes at rear of barge transfer concrete units from haul barges to assembly deck. *Corps of Engineers photo.*

transfer squares from delivery barges to the sinking barge deck. Enough squares are placed across the deck to completely span it. Crewmen proceed to inter-connect the squares with special clips and twist wires which develop individual strengths of 4,000 pounds.

In joining the adjacent squares, the twist wires also inclose steel cables. Each of these cables in the space between squares is threaded through a housed series of friction blocks located beneath the crane deck.

When all the squares lying on the incline deck have been connected, the under-deck cables are payed out and the sinking barge is moved out. The two operations pay the "launch" of mattress off into the river. Just before the first launch leaves the deck, the mechanism is stopped.

The crew then fabricates a second launch of squares on the incline deck and ties it to the ends of the first launch. The procedure is repeated as the sinking barge moves farther into the river until the mattress covers the specified area of river bottom.

Plant Move-Up

When the entire mattress has been placed, the plant, including both barges, moves upstream enough to launch the next mattress which will overlap the previous one. Thus, overlapping mattresses will cover the bank to the limits set for the job.

To complete the revetment, a crew paves the upper bank. Paving usually extends from the inner edge of the mattress to the top of the graded slope. Much of the bank receives a coating of rip-rap with stone size ranging from 25 to 125 pounds. Clamshells place the rock and crewmen rearrange it by hand to form a compact surface. In addition, a 94% by weight river-sand asphalt paving covers the bank from mat to bank top. A floating mixing plant supplies the mass asphalt which is applied in a 5 to 6-in. uncompacted layer.

Corps Personnel

In the Memphis district of the Corps of Engineers, Col. A. F. Clark, Jr., is the district engineer while his assistant is Lt. Col. Paul E. Gardner. The construction superintendent in charge of the Bank Protection Party No. 11, which operates both the new grader units, is Marshall Strong. The construction superintendent in charge of Mattress Sinking Party 9108 is Thomas A. Goodwin, Jr.

• Left: "Stump splitter" prepares to rip stump in half so that it can be easily pushed out of the ground. Right: Sword-like blade slices through stump as tractor drives forward. Once split, stumps are pushed out of ground by swinging tractor and blade from side to side.

Large Stumps No Match for Splitter

Fitted to Bulldozer blade, steel wedge can clear stumps ranging up to eight feet in diameter.

FACED with a job of clearing stumps, ranging up to eight feet in diameter, from a new highway right-of-way on the Olympic Peninsula, Thomas Scalzo Co., Seattle, Wash., contractors, designed and built a stump splitter of armor plate steel which they fitted to their Bucyrus-Erie bulldozer blade mounted on an International TD-24 crawler tractor.

This unique piece of equipment was constructed from a 4x6-in. bar of armor plate steel, 48 inches long. The business end was sharpened to a point and the other end was welded to a ½-in. steel plate which was shaped to fit the curve of the bulldozer blade. This plate was fastened to the dozer blade by eight ½-in. bolts placed along the cutting edge of the blade with a ½-in. bolt at the top of the plate to steady the rig. A 1-in. gusset was added to each side of the stump splitter bar to provide the lateral stability needed when prying the stump.

In operation, the stump splitter is driven into the stump by the tractor, splitting the stump in half. The tractor then uses the swordlike pointed bar as a wedge and by pushing the halves of the stump from one side to the other, the unit uproots the entire stump in a matter of minutes. The uprooted stumps are then pushed into piles and burned.

According to the owners, the largest stumps require several passes with the tractor but the stumps are always removed and in the fire in less than 20 minutes time.

Scalzo's initial use of the TD-24 and stump splitter was on the company's contract to clear 4.75 miles of right-of-way for a by-pass which will carry state highway 21A around the town of Poulsbo on the Olympic peninsula, Washington.

The route is in low, swampy terrain with little rock and only a few boulders which will require blasting. However, the entire route is studded with large stumps and Scalzo Co. estimates that the TD-24 and stump splitter saved at least 5,000 pounds of blasting powder as well as the time and labor involved in preparing the stumps for blasting.

• Contractor Bob Scalzo, of Thomas Scalzo Construction Co., Seattle, explains design and function of his homemade "stump splitter" which is fastened to Bucyrus - Erie bulldozer blade mounted on International TD-24 crawler to equipment salesman Ralph McKernan of Howard - Cooper Corp.

They're Rebuilding Columbia Gorge

by Ray Day

Oregon's most scenic highway job advances five more miles as 4-yd. shovel helps contractors make impressive progress.

• A Euclid end dumps off one of 120-ft. fills on U. S. 30 reconstruction near Hood River, Ore. Easy curve in background will allow high speed driving.

YOU won't see this kind of set-up twice in a lifetime. Suppose you designed one of the toughest highway jobs in America. You had to go to 125-ft. fills, 140-ft. cuts, and bridge the Columbia River in 90 feet of water with an earth fill. Suppose you put 1.5 million yards of dirt and rock and borrow material in only five miles of distance, because the scenic terrain was so rough.

Then suppose you were able to get a select bunch of old time dirt stiffs, whose names were separately famous a decade ago on some of America's most spectacular projects of that time.

Carrying the idea further, suppose this select gang was able to get the latest 1952-model equipment, and to pool their collective brains and experience in setting up an equipment operation, maintenance and safety program.

You'd have a speedy job, an interesting job, and the fun of your life.

Such a set-up seldom happens, but by some quirk of chance that exact formula is being filled on U. S. 30 from Hood River five miles west toward Portland, Ore. The contractor is the Guy F. Atkinson Company of Portland and San Francisco. The job is a 5-mile, $1.8 million section of Oregon's spectacular relocation of the 90-mile highway between Portland and The Dalles. When designers of the Oregon State Highway Department made the plans for this section, it seemed such a tough piece of construction that over two years was allowed for its completion. Only three months after starting the major excavation phase, the contractor gang was a year ahead of schedule.

At Hood River, there's a little 30,000-yd. chunk of excavation at the tail end of the job which has to move across

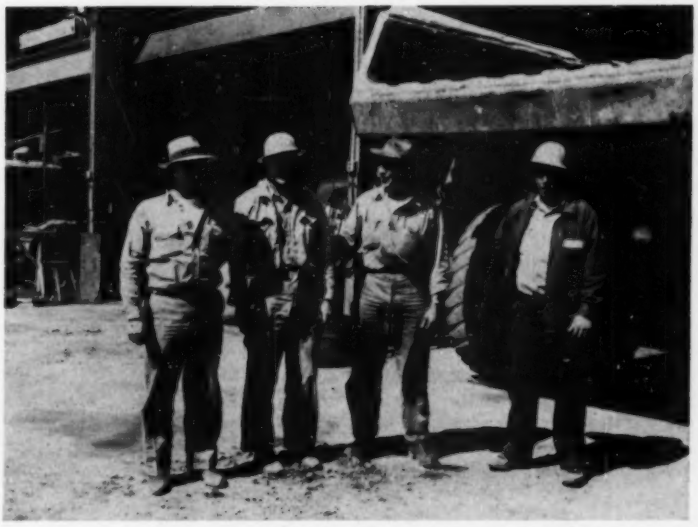
• His men think he's about the smartest project manager in the whole northwest. He's A. H. "Gus" Steiner, who helped build Denison Dam in Texas and Dorena Dam in Oregon. Radio-equipped Ford keeps him in close touch with office.

a new overpass under construction by another contractor. It will have to be subcontracted because the gang of old timers moved so fast they were done with the dirt before the overpass was half finished.

Introducing the Men

Because the human element has played so important a part in the speed of a normally tough highway job, some of the key figures are as important as anything else about the job There's A. H. "Gus" Steiner, who may be remembered as one of the builders of Denison Dam in Texas before World War II, and later on as project manager for the builders of Dorena Dam in Oregon. There's John Skeels, project engineer, with a decade of construction engineering with Pacific Gas & Electric Co. behind him, Orville Paul, general superintendent, and Ernie Ford, master mechanic. You see faces you saw at Grand Coulee, Shasta, Fort Randall —Jake Coffey, Joe Baker. Even a few youngsters are mixed up with the gang. There is Ray Atkinson, assistant project manager. He's Guy Atkinson's grandson.

Strangely, too, the Oregon Highway Department's old timers are extremely interested and active on the project. Old Man Chandler, division engineer, and no disrespect intended, with Dean Swift as his district construction engineer. Russ Blickenstaff, veteran resident engineer is there. Charlie Thomas, chief inspector: back in 1926 he was plowing snow on the maintenance gang which took care of the road at that time.



• Left to right are some of the well-known old timers on highway job: Jake Coffey, truck foreman; Orville Paul, general superintendent; Ernie Ford, master mechanic; and Joe Baker, tractor foreman.

It is this gang of men, working together, which has made the project seem very easy.

Item No. 2 in this unusual job is the project itself. To understand and appreciate it fully, it is necessary to consider what part the 5-mile relocation plays in the 90-mile over-all scheme between Portland and The Dalles.

For some years now, none but the adventurous or the scenic minded motorist regularly used U. S. 30 in traveling down the Columbia Gorge. Built many years ago, it had steep grades, very sharp curves, and several one-way tunnels. It dipped down to river level and climbed back up to the top of lava

• An International TD-24 crawler pulls scraper through broken rock and soil. This team is helping take out one of the shallowest cuts on the job. Caterpillar tractor with bulldozer and Bucyrus-Erie shovel move dirt farther back.

bluffs along the stream. The trip over the highway was one of the most scenic in America, but it was slow and dangerous. In recent years, people started to use Washington's Highway 830, just across the river. It had better alignment, although it, too, was far from perfect.

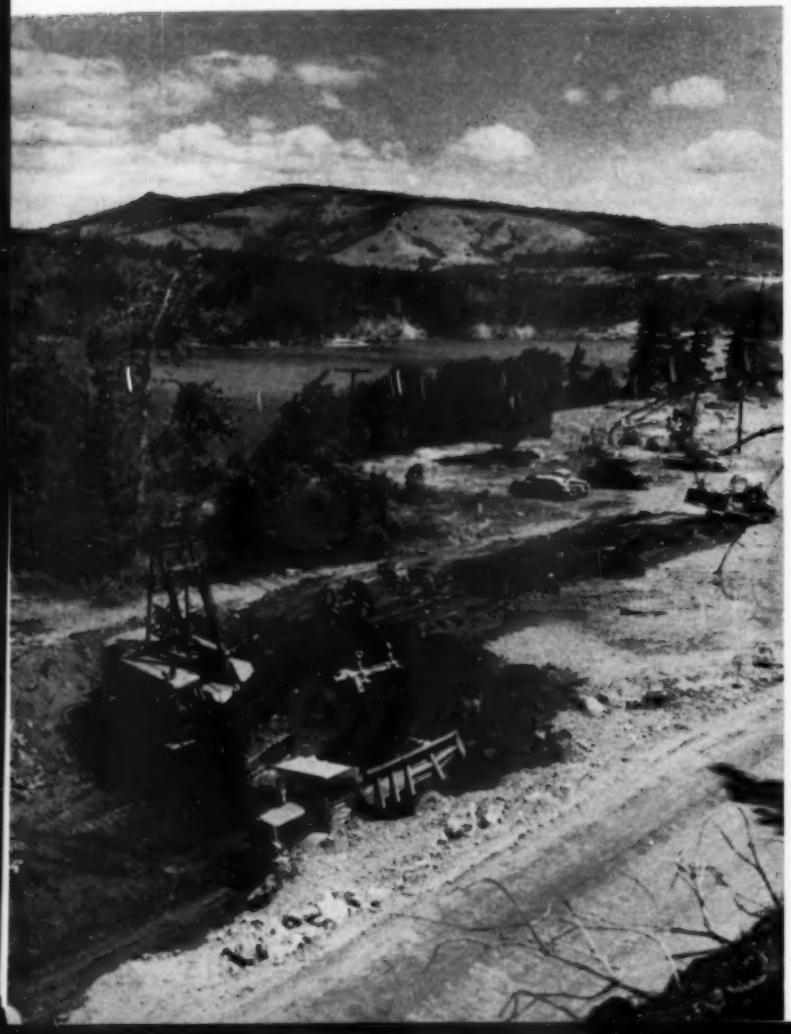
After World War II, the Oregon State Highway Department began to drive hard toward the reconstruction of the entire road up the gorge. Armed with Cost-Benefit Ratio statistics which were in excess of 3.0, they made location studies and scratched their heads over plans. There was no easy way to build the water-level controlled access express highway they wanted, nor was there any low-cost way. Where the new location touched the bluffs along the river, pinnacles of basalt stood in the way to be blown off, and deep gorges had to be filled and drained. Parts of the Columbia River bed near shore offered one spot for location in some places, so extensive hydraulic fill jobs with dredges were drawn up. The Atkinson job has a long section of Columbian River fill, which is being placed with land-based hauling rigs.

Access from many points along the old road to this new dream highway had to be made. The towns of Hood River, Cascade Locks, Bonneville, and The Dalles, for example, had to be hooked on. At Mosier, the town is separated from the highway by the old road and the main line of the Union Pacific Railroad, so extensive construction of reinforced concrete overpasses and bridges is under way to channel traffic on the new road. A dredge is also working above Mosier, and it belongs to General Construction Co. of Seattle.

The Atkinson section is a vital link between the work now finished and the work yet remaining. The express highway is now largely finished as far as Cascade Locks. Sections coming up for contract this summer will bring most of the remaining work under construction to The Dalles.

Because of ground water, hydraulic fills, and other such unfavorable construction conditions, the Oregon State Highway Department has followed a general policy of letting the paving jobs about a year after the fills are in, thus giving them time to take their final settlement. The Atkinson project, however, calls for grading, drainage, installation and production of a crushed sub-base course, and 3½ inches of asphaltic concrete paving. It may be that everyone expected the excavation to be the slow process it normally is, but the fact remains that the dirt men will long since have forgotten about the job when Conley Construction Co., paving subcontractors, move in when the state permits them to in 1953.

• Here a Bucyrus-Erie 88-B with 4-yd. dipper loads Euclid. In background are Washington mountains and Columbia river.



Good Organization

From start to finish, an orderly, well-planned procession of human effort and machinery has marked the heavy construction phase.

The contract was signed in November, 1951. It was an awkward time of the year. Snow can fall in this area any time in November, December . . . even up to March. Saturated ground conditions usually make winter excavation tough.

Steiner planned it carefully. The only things he moved in were a couple of D8 Cats, with dozers, and a small labor gang. Where the highway smacked up against the mountain sides, there were patches of fir, pine oak, and scrub brush. The labor gang used small one-man chain saws and axes to drop the tree cover. The dozers wooled around on the slopes, sometimes using angle-dozers, and did a combination job of pioneering and stacking brush. By the time spring came, the gang had the right-of-way cleared, the brush burned, and everything ready for full scale operation.

While Steiner bided his time at Hood River, major equipment from a 7-mile highway job at Oak Ridge, Ore., was

• A battery of Gardner-Denver 500-cfm compressors feed both ways through a common air line to drive wagon drills and jackhammers in the vicinity.

• First below: A Gardner-Denver wagon drill sinks a drift hole at low angle to blast loose a chunk of rock remaining in the cut. Second below: The angle is up now as the drill sinks a second hole.

moving into the company's Portland headquarters yard. It received what checking and service was necessary, and it wasn't much, as we shall see.

On the 20th of March, major equipment began to arrive and go to work. There was first of all a small tractor-scraper fleet, for short-haul work in close quarters. It consisted of four No. 80 Caterpillar scrapers, pulled by three International TD-24's and a D8. A D8 was assigned for pusher work, and two D8-drawn K-30 LeTourneau rooters moved in to rip up some of the formations. A careful examination showed some of the Type B yardage (B is considered to be rock; A is common excavation) to be a porous lava flow. Perhaps it would respond to ripping without too much powder.

The second unit of the equipment spread consisted of a fleet of eight Caterpillar DW-10's. These machines were brought in especially to handle a 110-ft. cut in granular, yellow material. The 80,000-yd. deposit was shot through with pockets of hard lava rock, all of which had to be ripped ahead of the machines.

There was no way to escape the hard fact that drilling and shooting would have to be done, however. Three Gardner-Denver wagon drills, with Timken steel and Timken tungsten-carbide bits were selected. There were also some jackhammers, and two big 500-cfm Ingersoll-Rand compressors.

Last, and by no means least, was a shovel spread. It represents what may be a trend in highway excavation: a switch to large equipment. There was

Euclids and large power shovels poured muck into the river fills faster than the water could rise to cut them away. Right: A Caterpillar D6 tractor and dozer levels out a heavy dump from one of the Euclids.

a Bucyrus-Erie 88-B with a 4-yd. Esco dipper—a new model in the Bucyrus-Erie line. A Bucyrus-Erie 54-B with a 2½ yd. Esco dipper, and a Northwest 80-D with a 2½-yd. dipper complete the loading picture. A fleet of 17 end-dump Euclids, of 14-yd. capacity, each powered by 300-hp Cummins Diesels, revolves around these shovels. Steiner planned the application of this equipment so the Eucs would haul at capacity two shifts a day to roll out the best possible production.

Equipment Selection Pays Off

Little construction time had gone by before everybody realized that this selection of equipment had certain peculiar advantages new to Columbia River roadbuilding. For example, one of the important fills in the project consisted of a 1,000-ft. section in water up to 90 feet deep on the outboard side of the Union Pacific railroad tracks. To build this fill, the state had arranged for about 400,000 yards of rock borrow material high up on a hill nearby, and provided entry under the Union Pacific tracks by means of a narrow underpass.

In the belief that he could speed construction of this important fill before the Columbia began its usual spring rise from snow run-off in the mountains, Steiner negotiated with Union Pacific for permission to construct a timber overpass over the tracks. This structure had the advantage of being up above any flood stage, unlike the low underpass. If his fill got caught on a rising river, he had a plan.

He also obtained permission to extend the borrow pit so equipment could operate on more level terrain, and set the 4-yd. 88-B in at the toe of a heavy talus slide to excavate the material. For a week the Euclids assigned to this machine dumped an enormous amount of material off the end of the fill. "We worked a week without making a pass with a dozer blade," said one of the old-timers. "Finally she built up to the surface and we could see she was sloping off on about 1½ to 1. Then we knew where we were going."

The 88-B sat and bailed as high as 3,000 yards in 8 hours, loading four 4-yd. dippers into the 14-yd. water-level beds. Often the machine made all four swings in a minute's time, and in peak digging, 50 Euclids an hour often left the pit to roar off to the fill. It should be emphasized, however, that this was favorable digging in a talus bank under ideal conditions, and that the loading of blasted rock has proved to be more difficult.

When the fill started to build itself out over deep water, the advantage of high-capacity digging and hauling equipment began to show. It had been the experience of contractors on some of the other projects, where 1½ and 2-yd. shovels were used, to have the river eat away at the fills. Here, where both the 88-B and 54-B were bailing away, the muck was moving in so fast that more of it tended to stay in place.

Fill Beats Flood

But it was after a long stretch of the fill had been built up to the surface that the real crisis came. Suddenly the mighty Columbia turned loose and began to rise toward flood stage. Quickly the shovels and Euclids began to retrace the course with 1-ft. lifts across the fill. The water kept coming, but so did the rock fill material. Every time the river rose a foot, so did the fill. It was touch-and-go until the river stopped rising near its flood stage. The fill was in no danger, and dumping then resumed off the end of the fill. Not until then did anyone fully appreciate how the equipment, experience of the gang, the extension of the borrow pit and the construction of the overpass had all paid off. The state will have a sounder fill for that kind of contract planning.

Modern drilling and blasting methods are another feature of this tough

project made easy. Steel up to 24 feet long is being used for some of the cuts. Although the lava rock is exceptionally abrasive to shovel teeth and dipper lips, the tungsten carbide drill bits show very little wear after many feet of drilling. The holes are being bottomed at 2½ inches to allow column loading of the 40% Columbia Powder Co. gelatin sticks, and these holes are regularly drilled without any thought of changing bits on the way down.

In many places the solid rock is pocketed around more unstable formations which do not require shooting, but which may be shot through with ground water springs or seepage planes. An efficient plan of cutting these rock slopes to exact grade, without excessive jarring, is in use. A center block of holes is shot with instantaneous electric exploders, and the outside rows of holes are then exploded with millisecond delays up to No. 10. The use of delays in highway blasting often helps to break the material up finer, and tends to bunch the broken rock in better loading position for a shovel. Center instantaneous shots in the middle of a roadway cut heap up in a mound when the side delays kick other rows of holes in before this rock can come down. It is better, more controlled blasting. It gives truer slopes with less possibility of slides or sloughing for maintenance crews to worry with in the future.

Drill bit life is good enough so that no sharpening facilities are needed on the job.

A Super Equipment Program

From an excavating standpoint, one of the most noteworthy accomplishments of all is the cooperative program which these men have worked out. It combines equipment maintenance with safety, and safety with management, and management with economical operation. It's hard to tell where one leaves off and the other begins.

• A Northwest 2½-yd. shovel loads Euclid while D8 with dozer stands by to clean pit floor. Note absence of large loose rocks on hauling area.

The Euclid trucks are the same ones which the company bought new three years ago. They have over 6,000 hours on their time meters. Aside from routine maintenance and a valve job or two, only one engine of the 17 has had major repair work. The biggest number of the machines still are not using oil between changes . . . and they have the equivalent of 140,000 miles of normal highway travel!

You can still find tires on some of the DW-10's stamped "DDC". That stamp stood for "Dorena Dam Constructors" three years ago. There are tires on the Columbia Gorge job with 1,800 hours of service, with as many as three recapping jobs, some with as high as three sectional vulcanizings.

In case it isn't generally known, these big tires are often ready for their first retread in 300 to 400 hours, and in rocky going like this they can expect to ruin many a tire as it runs over sharp rocks. It isn't unusual to see a Diesel engine starting to use oil in less than half the hours these machines have.

The answer to such performance consists of a relentless, almost holy crusade to make equipment and tires last. Euclid drivers never get a chance to handle one of the machines until they've made a student run before the hard, unsmiling eyes of the foreman of that spread. If a Euc skinner makes inane little remarks like "I'm not sure where the starter is in these newer models," he'd just as well start down the road. To these grizzled old foremen he doesn't know Eucs. They want men who do.

When they find them, the arrangement still isn't over. They give these men some "do's" and "dont's."

"Each one of these rigs cost the company about $29,000," the man is told. "We don't want you to get yourself hurt, and we don't want you to hurt the equipment. We'll not tolerate cowboy driving. The first time you're caught snap shifting (it's a power shift that places enormous strain on the rear wheels and the whole transmission, which many truck drivers habitually use) it means your job, Mac, and we're not kidding."

"Don't be afraid to call anything, however slight, to our attention. Any

• Guy F. Atkinson forces built overpass to leased borrow area. Thus railroad traffic can be ignored and haul proceeds unhindered.

• This is Guy F. Atkinson Company's 5-bay heavy equipment repair shed where major check-ups and repairs are made when necessary.

noise, rattle, broken part, we want it fixed. If you cut a tire, we don't want it run another foot; we want to pull it off and fix it.

Keep Tachometer Record

"We'll be checking your tachometer recorder every day. See to it that no reading over 2,100 rpm ever shows on it. If it does, we'll expect a sound explanation. If it happens twice, we hope you'll understand there's no hard feelings, but you'll have to draw your time."

An operator of a Euc in one of the narrow cuts or on one of the fills cannot ever back his machine or move it until he can clearly see a dump man or truck spotter, who are hired for all shifts. One of the reasons for this is safety. Another reason is because the dump men and spotters are loaded with responsibility for tires. Not only are they expected to keep loose rock thrown out of the way, but they are supposed never to back a unit over a rock. Motor graders and dozers are around every spread to keep the floor absolutely clean.

The equipment maintenance work is tied in very closely with its operation, too. Each shovel, each Euclid, in fact every piece of equipment on the job, looks new. There are no broken windshields, bent doors, no faded paint, no visible damage. Once every month every piece of equipment is completely checked and examined. Once each day each piece of equipment is visually checked for any sign whatever of damage or excessive wear. Once a shift each unit is fueled and lubricated. Extensive lubrication and service is done every night on the graveyard shift, for operations are confined to two working shifts.

Engine oil is changed in the shovels at about 60 hours, in the Euclids and Cats at about 80 hours. Richfield Circle C high-detergent oil is being used throughout the engine fleet. It is even being used in pick-up trucks and passenger cars.

Radio Speeds Work

Four 2-way Motorola transmitters on the project help to tie everything together. Two mechanics with pickup trucks are out on the project each shift. Their trucks are not radio equipped, but three of the key superintendents' cars are, and action is fast if anything breaks down. It usually doesn't, however, with the careful operation it receives. There are a total of 12 mechanics and 6 grease monkeys for the three shifts.

One of the most advanced types of service and fuel units is being used. The service unit is truck mounted on a 4-wheel drive unit, and can go to any piece of equipment on the job. Recently a Ford F8 truck with tank supply of gasoline and Diesel fuel was added. It has double sets of gears in its rear-end transmission and can go about anywhere. Moreover, it will deliver fuel at a much higher rate of speed than many of the conventional rigs now in use.

No better case could ever be made for the intelligent, careful use of equipment than the Columbia Gorge project exemplifies under the present contracts. And it is significant that this careful use of equipment is resulting in the most spectacular progress showing which any of the many contractors has made as the new highway advanced up the river.

Paving in the Future

Paving and the installation of sub-base will be a job for 1953. Much of the sub-base material is now being stockpiled in the center of the project. It will be laid down, windrowed, blade mixed, watered, and rolled to get a tight, high-bearing base. The thickness of this material will vary from five to seven inches. Two courses of asphaltic concrete, 2 and 1½ inches, will be laid to form the pavement. It will be 24 feet wide when it is finished. Shoulders will be from 6 to 10 feet wide. In general, the new roadbed is about 50 feet wide at the top. Both the subgrade and sub-base are crowned for drainage, and positive drainage is assured since the sub-base material extends full width. Oregon quit building pavements in trenches many years ago, because saturation of sub-grades and drainage problems have always been serious.

It will not be long before motorists can whiz along safely at 60 to 70 mph over a wide, smooth highway, down at river level where snow problems in winter are less severe than higher up. When that day comes, they can thank the engineers who had the vision and courage to make such a daring relocation, and they can thank one of the most unusual groups of old timers to be assembled on a construction job since Boulder Dam.

The whole outfit, from Steiner on down, didn't even grumble about wearing hard hats.

As we said, you probably won't see this kind of set-up twice in the span of your lifetime.

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Because they are tipped with Carboloy inserts—one of the hardest metallic substances known to man—Carset Jackbits drill the hardest rock with a *speed* and *efficiency* which cannot be approached by the finest steel bits.

For instance, Carset Jackbits drill 50% faster—last from 50 to 400 times longer—practically eliminate bit changes and double the life of drill steel. They eliminate tapered holes saving up to 30% on dynamite—permit longer steels and feeds—require much less maintenance—and boost tonnage as much as 50% or more.

These advantages all add up to a tremendous increase in footage per shift—*without increasing your drilling crews.* Remember Ingersoll-Rand offers a complete line of equipment and service for rock drilling. Take advantage of our highly trained and skilled personnel. There is an Ingersoll-Rand branch office and distributor near you. Write or call today.

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Modified Ditcher Speeds Texas Irrigation Work

Reising Construction Co. of Edinburg, Tex., built special ditching machine which excavates tapered canal and grades in one operation.

● Top: Ditcher cuts and finishes sloped canal sides in one operation. Wing cutting bars, powered by International U-4 engine, taper sides of trench. Above: Providing fill for new irrigation canal near Edinburg, Tex., International TD-18A crawler with Bucyrus-Erie Bullgrader pushes up to required grade while another TD-18A and scraper haul material for top fill. Adams motor grader in background levels off final grade. Behind it, special ditching machine carves out canal itself.

A 31,349-acre irrigation project under way for the Hidalgo County Water Control and Improvement District No. 15, near Edinburg, Tex., involves the use of crawler tractors, scrapers, motor graders and a novel ditching machine to eliminate a great deal of hand labor. Begun last December, the $1½ million project includes the construction of 20 miles of concrete-lined irrigation canal and approximately 100 miles of 12 to 30-in. concrete pipelines. When completed in the fall of this year, the system will provide a rich citrus-growing area with ample water.

One of the largest drainage and irrigation specialists in the United States, the Reising Construction Co. of Edinburg, prime contractors, designed and built a special ditching machine which excavates the canal and does the final grading in one operation. This modified Buckeye No. 9 ditcher has two cutter wings mounted on the sides of the machine and powered by an International U-4 engine. These winged cutter bars slice through the earth and provide a smooth, V-type ditch, ready for gunite concreting.

The usual method employed in this type of work required draglines and hand labor. According to contractor F. M. Reising, this is the only machine of its kind in operation today.

Since the canal right-of-way must be brought to proper grade throughout its length to provide for gravity feed of irrigation water, Reising found it necessary to build cuts and fills at various places along the route. An International TD-18A Diesel crawler tractor equipped with a Bucyrus-Erie Bullgrader was used to push up fill material from the borders of the right-of-way. Another TD-18A and scraper dug and hauled top fill which also was borrowed from the borders of the canal. Compaction was obtained from tractor-drawn sheepsfoot rollers and an International-powered Adams No. 550 motor grader did the finish grading on top of the fills. The ditcher followed these units and completed an average of 800 feet of ditch in each nine-hour day.

Spray on Gunite

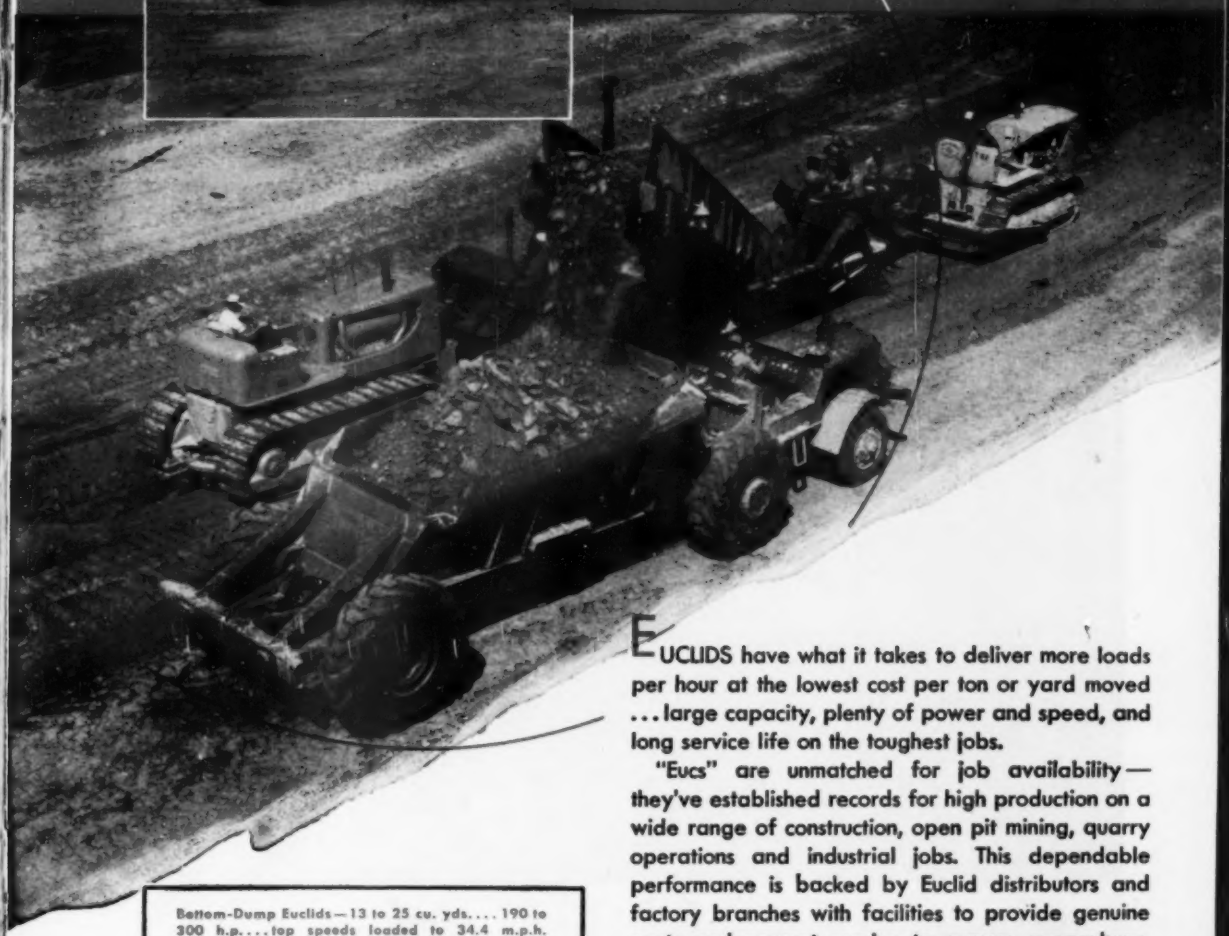
Once the canal sides were cut and graded, wire mesh was laid along the sides and gunite concrete was sprayed on to provide a waterproof lining. The gunite work was handled by the water district.

Largest canal in the system is eight miles long, 23 feet wide at the rim and 10 feet wide at the bottom. This canal is capable of transporting water six feet deep at the rate of 266 cubic feet per second. It feeds some 12 miles of smaller canals which are also lined with gunite concrete.

In constructing the 100 miles of concrete pipeline which formed the remainder of the project, Reising employed Austin-Western and Cleveland ditching machines of the conventional type and backfilled the trenches with an International TD-18A crawler equipped with Bucyrus-Erie Bullgrader. This work attained an average pace of 2,000 feet completed in a nine-hour day.

"Eucs"

Deliver More Payloads at Less Cost



EUCLIDS have what it takes to deliver more loads per hour at the lowest cost per ton or yard moved ... large capacity, plenty of power and speed, and long service life on the toughest jobs.

"Eucs" are unmatched for job availability — they've established records for high production on a wide range of construction, open pit mining, quarry operations and industrial jobs. This dependable performance is backed by Euclid distributors and factory branches with facilities to provide genuine parts and prompt service to owners everywhere.

Less down time and maintenance costs assure more profitable hauling. Have your Euclid Distributor show you how "Eucs" can deliver more payloads on your off-the-highway work.

Bottom-Dump Euclids — 13 to 25 cu. yds.... 190 to 300 h.p....top speeds loaded to 34.4 m.p.h.

Rear-Dump "Eucs" — 10 to 34 tons ... 125 to 400 h.p....spring mounted or semi-rigid drive axles ... top speeds loaded to 36.3 m.p.h.

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EUCLIDS *Move the Earth*

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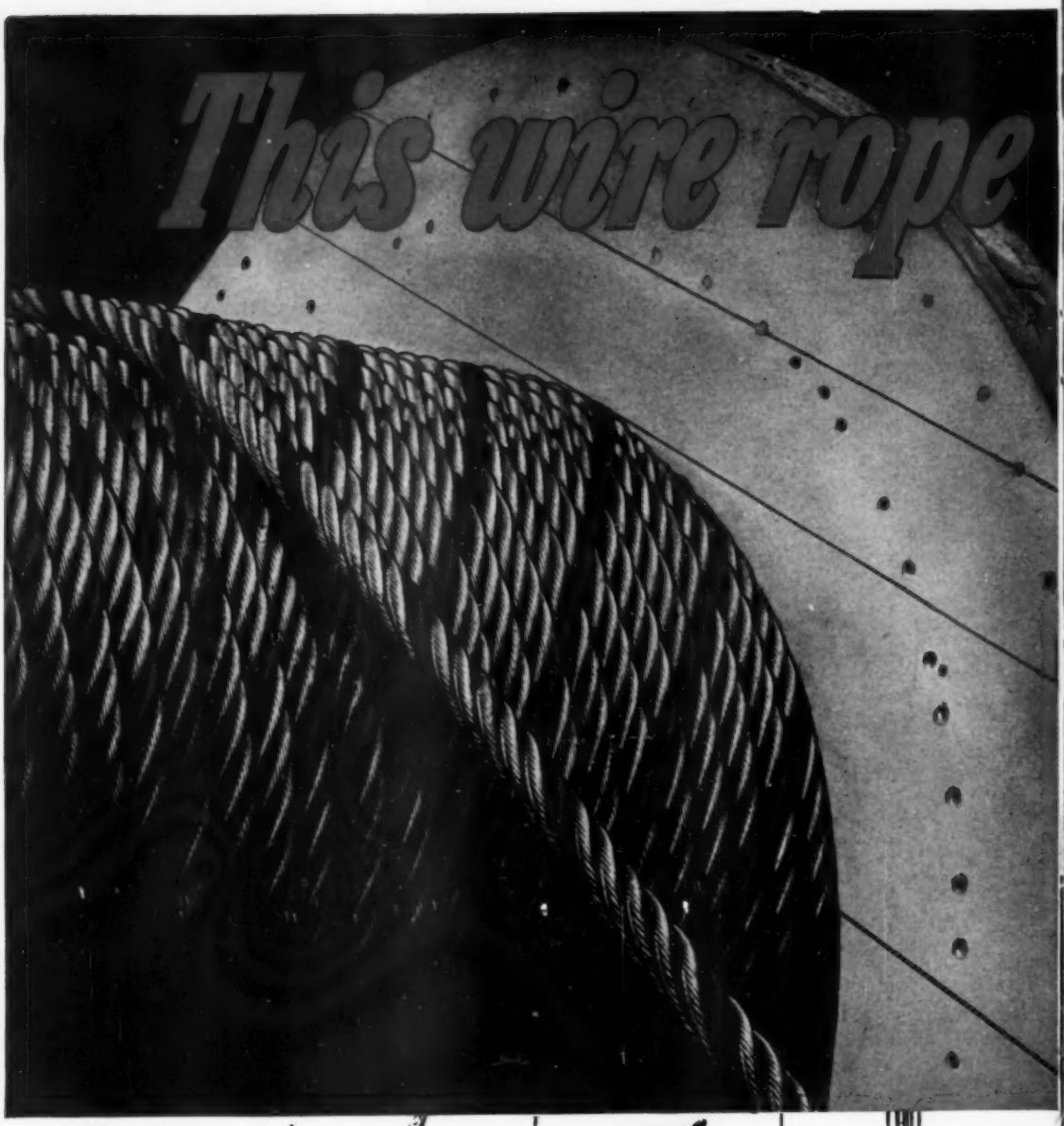

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must deliver...

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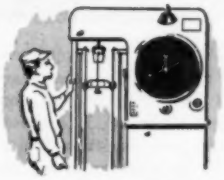

This is a primary principle of Leschen manufacture. It *must* give you Red-Strand wire rope that wears exceptionally long . . . delivers top tonnage. It *must* give you Red-Strand wire rope that saves workers' time . . . earns their complete trust.

You get manufacturing craftsmanship when you use Hercules* Red-Strand wire rope. Leschen management and workmen know wire rope inside and out—*it's their only business.* They know how to make it better. Generations of the Leschen family—and workmen's families—take pride in producing a product that will serve you better.

You get exactingly tested wire rope when you use Hercules Red-Strand. Every coil of wire that goes into Leschen rope is rigidly torsion- and tension-tested. Every rope is double-checked for accurate fabrication—diameter, length of lay, strand clearance, lubrication. During World War II, millions of feet of Leschen wire rope passed every test by the Armed Forces *without a single reject.*

You get individual attention to satisfy your exact needs. Every executive, representative and workman in the Leschen organization follows this 95-year-old policy. Records are kept on every length of wire rope made in the Leschen mill—to provide rechecks on every installation—and to help you get the best type and grade of wire rope for your specific application.

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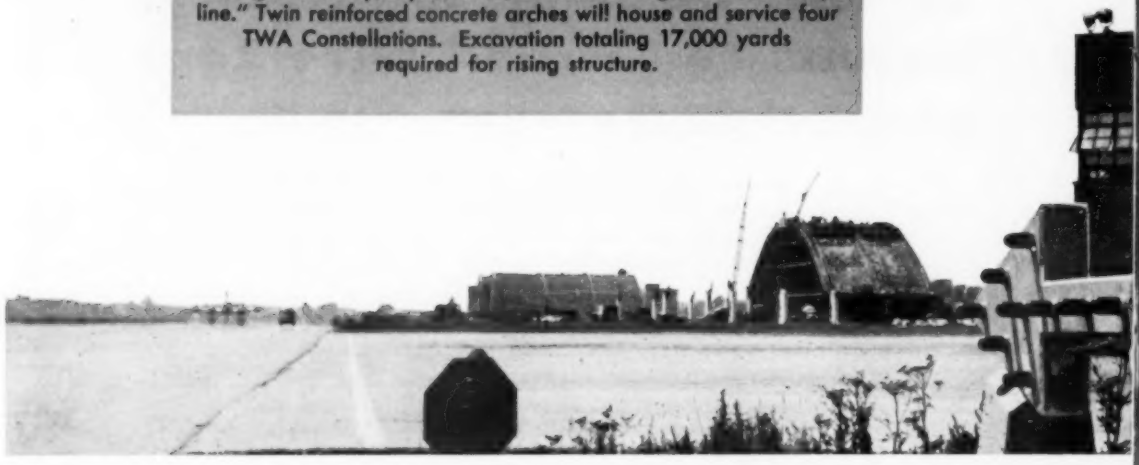
DISTRIBUTORS IN ALL PRINCIPAL CITIES

Chicago Hangar Reflects Soaring Air Business

Chicago's Midway airport sees $2.5 million hangar added to "skyline." Twin reinforced concrete arches will house and service four TWA Constellations. Excavation totaling 17,000 yards required for rising structure.



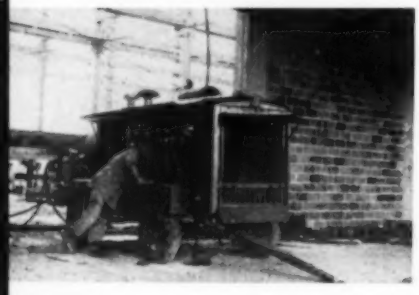
THE coffeeshop at Chicago's Midway airport was swarming with hundreds of persons as usual. Near the window a white haired man stared out at the flights that were then landing and leaving at the rate of more than one a minute. He couldn't resist telling of a day at this airport about 25 years ago. The white haired gentleman was to be the sole passenger for the day. He was going to St. Louis along with several sacks of mail and a pilot named Charles A. Lindbergh.

But today parked around the terminal were a score of planes representing over a dozen airlines. Our pioneer passenger to St. Louis looked beneath the wing and tail assemblies of several planes. His line of sight was directed to the north end of the field where the "skyline" of the airport was being broken by the twin arches of a new hangar.

At this moment two cranes, one at each end, were pouring concrete for one of the hangar arches. A closer look revealed that about 100 men were working on this hangar being constructed for Trans World Airlines at a cost of $2.5 million. This latest symbol of expansion was begun last October and completion is expected in November.

The contract with the O'Neil Construction Co. of Chicago states that the hangar must be ready to house and service planes by the 1st of December, 1952. At the moment TWA is using the facilities of Eastern Airlines.

The new TWA accommodations will actually consist of two interconnected hangars with ample office and storage space in the rear. The rear of the hangars borders Chicago's 55th street while the huge open arches will face south. Each of the two arches will be able to span two four-engine Constellations, or six twin-engine Martin planes. The central portion of the hangar floor is designed for aircraft weighing 150,000 lbs.



• Underneath hangar arch, Ingersoll-Rand rotor type 600 cfm compressor powers vibrators used during concrete arch pouring operation.

To House Four Planes

The hangars are 270 feet wide and will have a clear height of 64 feet. The total height will be 67 feet. Both hangar No. 1 and 2 will have a floor area of 36,000 square feet. The north to south dimension of each hangar is 125 feet.

When *Excavating Engineer's* representative visited the job, the O'Neil crew was pouring concrete for half the arch for hangar No. 2. About 425 yards of concrete were used in the pour for the 3½-in. reinforced shell. The pouring operation was begun at 7 AM to insure completion before sunset.

At each side of the hangar a movable

• Right: Hough front-end loader dodged traffic while cleaning up sewer excavation on crowded 55th street. Ciccone Bros. of Chicago has sewer contract.

concrete platform was used. The two platforms were slowly hoisted to the top of the hangar by electric winches made by Sasgen Derrick Co. of Chicago. Two Bucyrus-Erie 22-B transit cranes supplied concrete to the dual hoppers on the platforms. On each platform three men manipulated the concrete buggies. The transit cranes were hoisting ¾-yd. Insley concrete buckets. The tire-mounted cranes were an advantage on this job because they had to work on the trowled finish floor of the hangars.

Three More Pours

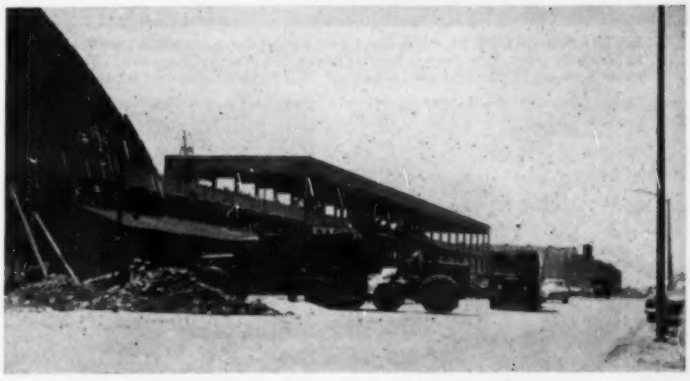
Three weeks were required to erect the falsework which was designed by Timber Structures of Portland, Ore.

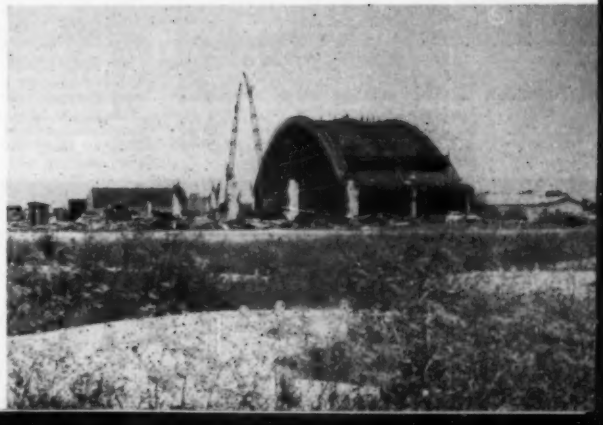
Continued on page 38

• Many planes leaving Midway airport rise up over these lights. Bucyrus-Erie 22-B transit cranes working on hangar were required to fly red flags from boom ends to warn low flying planes.

• Eight trucks supplied concrete to cranes. Jaeger mixers mounted on Sterling chassis carried about seven yards each trip.

• Below: Looking east, office and storage area frame is visible (left). Second reinforced concrete arch will front this area. Idle machine is Foote Model 34-E 1¼-yd. paver.





It's the Operators'

BEST BY A DAM SITE. Troy Hood and Jack Rank (shown here with Dirt Foreman Sam Crawford) operate TD-24s for Guy H. James, building the great Oahe Dam in South Dakota. Hood says: "I can keep right behind the scrapers—catch 'em sooner and push 'em out faster because TD-24 controls are easier." And Rank chimes in: "Much easier to handle than any other tractor."

"ALMOST THINKS FOR ITSELF!" That's what Jess Leatherwood says about the Big Red TD-24 he operates for Macon Construction Co., Franklin, N. C. "It pushes more, moves it faster and handles easier than any other crawler I've ever been on."

"WE RIP PLACES YOU'D USUALLY HAVE TO BLAST," says another Macon operator, Roy Cantrell. "We've been working in the Blue Ridge Mountains on rock you couldn't touch with a dozer till the TD-24 came along. Now we blade where we couldn't scratch before, and rip where we used to dynamite!"

"OUR TD-24s REQUIRE LESS SERVICE," says John Tickler, Service Superintendent for John E. Bloomer Construction Co. "These big red machines are very accessible, very easy to maintain. And when we do need help, the International Distributor is always on the job!"

Crawler!

TD 24

Read what the operators and servicemen say about "Big Red", the International TD-24...

"HOW DO I LIKE 'BIG RED'?" asks George Miller. "Listen: This TD-24 is just the fastest and surest handling tractor there is, that's all! Nothing I've seen can touch it for moving dirt." George and his TD-24 move dirt in North Carolina for Kiker & Yount Construction Co.

"GREATEST THING I'VE SEEN," says Bruce Olson (right), TD-24 operator and Sec.-treas. of G. A. Olson Construction Co., Marshall, Minn. "The TD-24 is the easiest crawler of all to operate. The high-low shift is great for whipping around to the cut after dumping the load. It's the fastest equipment going for anything up to a 3,000-foot cycle!" Man in center is Glen Olson, Bruce's brother and company president. At left is Superintendent Donald Young.

Ask the men who know. Ask the operators. They know that *this* makes "Big Red" the Champ:

TD-24 POWER

148 maximum drawbar horsepower, more than any other crawler on the market.

TD-24 SPEED

Up to 7.8 m.p.h. with 8 forward speeds, 8 reverse. Moves loads faster, gets back quicker for more work-cycles per hour.

TD-24 STEERING

Fingertip control for pivot-turns, feathered-turns and *turns with power on both tracks.*

TD-24 STARTING

Exclusive International push-button starting for quick starts any time in any weather.

Want to know more reasons why the Big Red TD-24 is the work-champ of the world?

Ask your International Industrial Distributor. Ask TD-24 operators. Ask the men who know—and you'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

SEE YOU AT THE POLLS!

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

Hangar

Continued from page 35

The same falsework structure will be used for the other three pours. To complete the arch for hangar No. 2, staging will be lowered on rails and winched forward to its next position. The rail system will also be used to move the structure to hangar No. 1.

Eight trucks were busy keeping concrete on hand for the cranes. The Jaeger mixers mounted on the Sterling chassis carried about seven yards on each trip.

By noon about 60% of the concrete had been poured on the hangar arch and the moving platforms were already gaining altitude. Later in the day when the platforms approached the crown, the long booms of the 22-B transit cranes were needed for the 67-ft. high structure. The booms measured 80 feet with a 20-ft. jib extension.

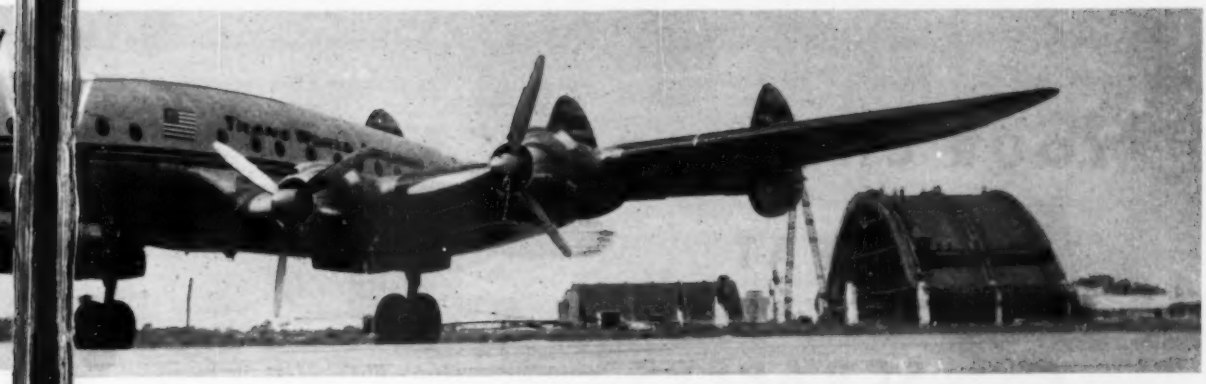
Up on the platforms two Roeth gas operated vibrators and four Ingersoll-Rand air vibrators gave a final set to the concrete. Underneath the arch an Ingersoll-Rand rotor type 600 cfm compressor powered vibrators as well as other air tools. This compressor used a 671 General Motors Diesel.

During the day several cylinders of concrete were taken for future testing. The concrete for the arch ribs and shell is to have a minimum ultimate strength of 3,750 psi at the end of seven days. The arch is designed to resist a wind velocity of 90 mph.

The reinforcing steel for the hangar is intermediate grade new billet steel with a minimum yield point of 40,000 psi. A total of 754 tons of steel will be used in the building. Steel supplies are on hand for the entire structure.

In mid-afternoon, workmen started nailing wooden strips to which the

• Views above and below show handling of concrete. The ¾-yd. Insley bucket is hoisted to one of dual hoppers and discharged. Buggies then distribute concrete on arch. Note that center rib was filled before shell area.



roofing will be secured on the concrete poured that morning. Later a 1-in. layer of fiber glass will be laid between the nailing strips. By 7 PM the 22-B transit cranes had met in the center of the hangar and were lowering the platforms.

Staging was to be removed in about four days and preparations then started for the next pouring operation. The final pour was made on August 26.

Master Mechanic Ed Donovan had no complaints about the day's operation. He expected that the next pour would be a faster operation as a result of practice gained on the first pour. Besides the hangar project, Donovan had an added interest on the job site. He was directing transformation of a Trailmobile van into a traveling repair shop. He carries many tools in a small panel truck but finds this inadequate. The much larger van will permit the installation of larger power tools such as drill presses. Then with a source of power he'll be in business.

Roomy Job Site

The job site provided plenty of elbow room although the noise from the many planes taking off did slow down verbal communication at times. As warning to low flying planes, small red lights were installed on the highest points of the hangar arch. Cranes were required to fly red flags at boom ends for safety.

While concrete was being poured for the arch, the Ready Coal & Construction Co. of Chicago was working on the hangar apron. Only 100 additional feet of apron had to be installed in order that paving extend out to the runway.

• One of eight ready-mix trucks on the scene rushes out for new load. Trucks supplied 425-yards of concrete for day's pouring operation.

• Four of these Constellations will be accommodated in new hangar. Central portion of hangar floor is designed for aircraft weighing 150,000 lbs.

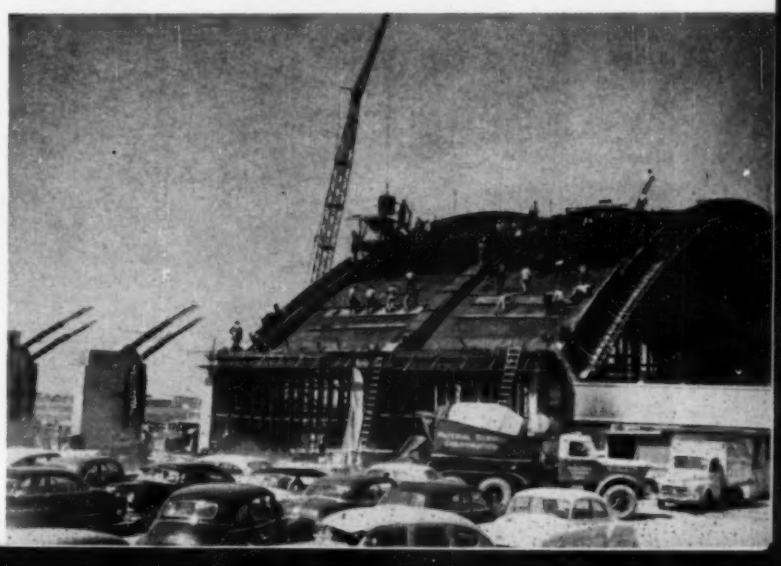
• Here is Master Mechanic Ed Donovan and his mobile tool chest. He is now directing transformation of Trailmobile van into traveling repair shop capable of carrying power tools.

Almost all of the excavation for the apron had been completed. A Caterpillar D4 equipped with a Traxcavator front-end trimmed around an underground power line.

A LeTourneau 15-cu. yd. scraper excavated most of this apron section to a depth of about two feet.

The spoil area for the excavation is located on the west end of the field. The airport was built in a low area and many shallow spots still exist simplifying the disposal problem. Another safety regulation of the airport is the strict 15 mph speed limit placed on all ground vehicles. This regulation was strictly observed by contractor's ve-

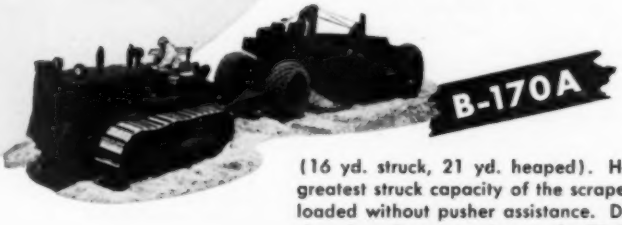
Continued on page 42



YOUR CHOICE OF 3 GREAT B-TYPE SCRAPERS

(22 yd. struck, 27½ yd. heaped). Largest scraper in current production available for use with crawler tractors. Developed along with the International TD-24 tractor to fully apply its unusual working capacity.

(10 yd. struck, 14 yd. heaped). Engineered especially to work with the International TD-18A Tractor and make a matched dirt-moving team of championship caliber.



(16 yd. struck, 21 yd. heaped). Has greatest struck capacity of the scrapers loaded without pusher assistance. Designed as the companion to the TD-24 tractor — takes full advantage of its superior speed and power.

Each of these three Bucyrus-Erie B-Type Scraper models loads with the same "fountain" action that breaks up chunks and boils material up through to fill the bowl completely.

Each hauls easily on big tires, and has the stability that comes with low bowl height, wide spaced rear wheels and proper weight distribution.

Each dumps fast and clean with the same positive *rolling* action — a type of ejection that requires less horsepower and thus permits dumping in higher tractor gear.

Each has the design refinements and strong construction throughout that mean extra ease of handling and servicing, extra yardage hauled, extra long life.

BUCYRUS ERIE

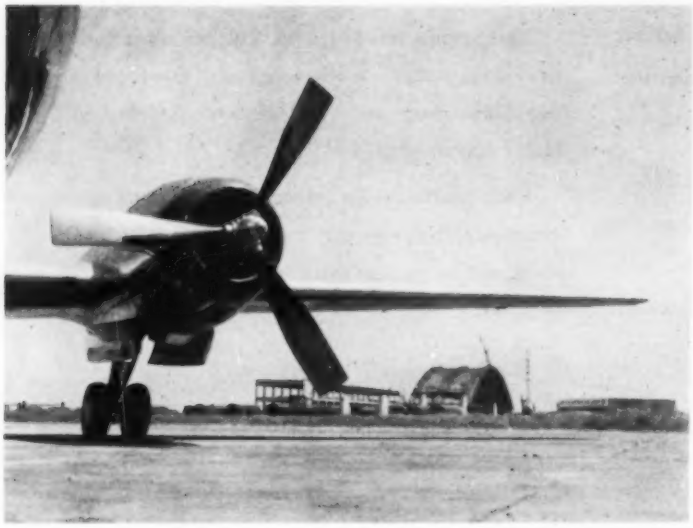
SOUTH MILWAUKEE, WISCONSIN

BIG RED TEAM

CONTINUES TO WIN ON PERFORMANCE

Time after time the Big Red Team — International TD-24 Tractor and Bucyrus-Erie B-250 or B-170A Scraper — comes out on top in actual field tests. It hauls more yards, loads and dumps faster, has shorter overall cycle time than comparable units. But why not find out for yourself? Ask your International Industrial Tractor Distributor for a demonstration.

BT52C



• Fourteen gas tanks await their addition to existing inadequate fueling facilities. Eastern Air Lines' hangar (right) being used by TWA, must be vacated by the 1st of December.

Hangar

Continued from page 39

hicles throughout the entire time they were on the job.

Excavation connected with the hangar construction comes to a total of 17,000 yards. This includes the excavation for the hangar itself and the basement area in the rear of the hangar, the apron, and the gas tanks. The fueling facilities require the installation of an additional fourteen 15,000-gal. tanks with excavation for the tanks partially complete. A Bucyrus-Erie 38-B clamshell excavated for the hangar and is going down 16 feet for the gas tanks. The 38-B was using a 1½-yd. Blaw-Knox Bucket in clamshell service and a 1½-yd. Bucyrus-Erie bucket with dragline front end.

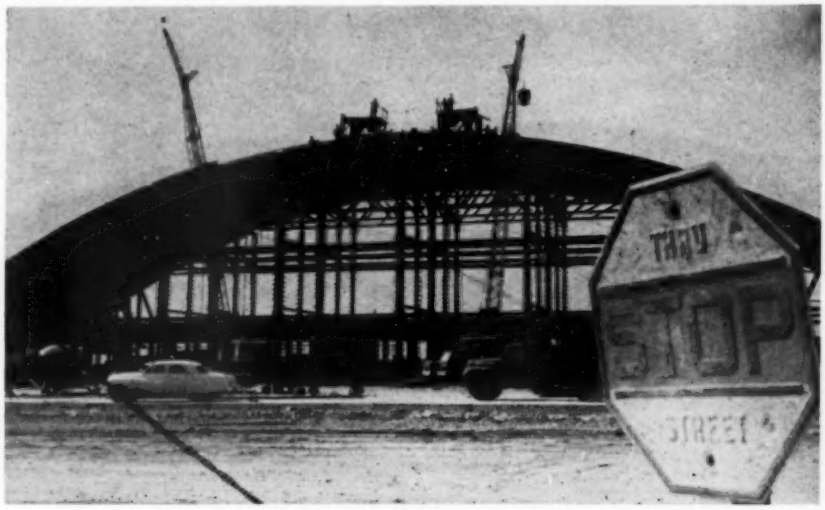
Considerable excavation was required for the buttresses which support the arch (three rows of five each). The buttresses, measuring nine feet in depth for a width of 23-ft. 6-in. at the center, are sloped on the bottom for a width of 15-ft. 6-in. on each side to better resist the thrust of the arch. Between each buttress is a 3-ft. 2-in. pad of concrete, the same width as the sloped sections and following the same bottom grade. This sloping necessitated a fair degree of accuracy on the part of the dragline operator. Above the ground the buttress stems measure 2-ft. x 4-in. in thickness, 16 feet in width and 20-ft. x 10½-in. in height.

Two of the machines on the job play handyman roles. A Bucyrus-Erie H-3 Hydrocrane loaded steel, forms, etc. and a Hough ½-yd. front-end loader provided transportation for a variety of supplies. Other machines found on the job included: an Allis-Chalmers HD-9 with front-end loader, a Wilson 300-M welder, a Hobart 300-M welder, and a Foote Model 34-E 1¼-yd. paver.

The hangar was designed by Amman & Whitney, consulting engineers of New York City and Milwaukee. Alex Zabore is project manager and Otto Olson is field superintendent. The resident engineer for TWA is C. C. Heyinger.

Air Industry Climbs

Perhaps much of the equipment assembled for this TWA hangar will see an ever increasing amount of service at or around airports. This becomes more likely when you consider that during 1951 revenue passengers increased from about 19 million to more than 24 million, a gain of 28%. Revenue passenger-miles flown were up 30%, to more than 14 billion. For the first time, U. S. air transportation became a $1 billion industry.

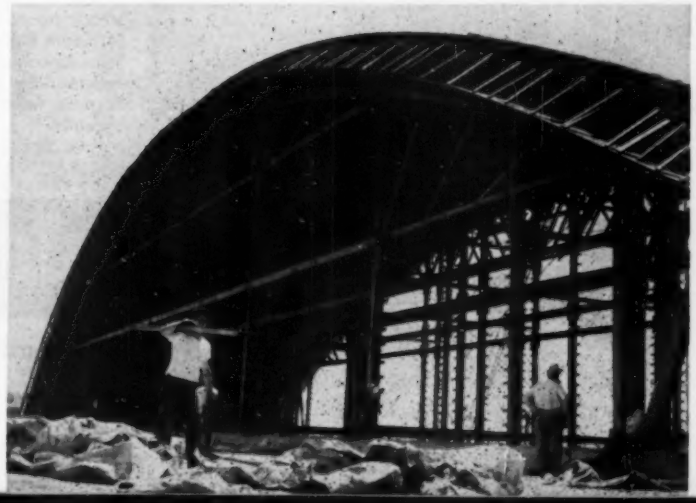


• With the booms of both cranes almost meeting at center of arch, crews will soon be able to "stop." Traffic sign is for automotive traffic which skirts edge of runways at a safe 15 mph. Staging when ready for removal is lowered on rails and winched forward to next position.

• During pouring operation concrete samples were taken for future testing. Concrete for arch and ribs is to have minimum ultimate strength of 3,750 psi at end of seven days. Upon completion of hangar, about 11,500 yards of concrete will have been used.

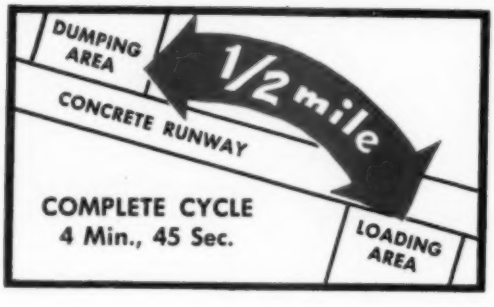
• Only 100 additional feet of apron had to be installed for paving to extend from hangar to runway. Caterpillar D4 equipped with Traxcavator front-end trimmed along power line and runway. Spoil area was conveniently located on west end of field.

• Previous fueling facilities are exposed by new partially completed excavation for additional tanking capacity. Excavation here extends to about 16-ft. depth. Total of 17,000 yards of excavation is called for in this project.



• Roller coaster-like scene presents itself in rear view. About 120,000 face bricks and 50,000 concrete blocks are required to close up structure.

"M-R-S pays off -



M-R-S 150 *SELF-LOADS* 10 yard struck Bucyrus-Erie B-113 scraper on St. Louis, Missouri Municipal Air Port job. Average time required for one self-loading and hauling cycle over ½ mile haul was four minutes, 45 seconds.

M-R-S MANUFACTURING

Sold in all Foreign Markets Through **INTERNATIONAL HARVESTER EXPORT COMPANY**

long or short hauls"

Says NORVEL MORICE

MISSOURI CONTRACTOR

Shown above is Contractor Norvel Morice of Ferguson, Missouri, owner of the M-R-S 150 tractor.

OFFERS HIGH SPEED PLUS OUTSTANDING SELF-LOADING ABILITY!

On this long haul job where minutes count . . . . M-R-S rubber tired speed and high production pay off. The M-R-S 150 speeds down a ½ mile concrete runway to the dumping area, after self-loading a 10 yard struck, 12½ yard heaped scraper by use of the M-R-S exclusive WEIGHT TRANSFER.

As contractor Norvel Morice, of Norvel Construction Company says, "My M-R-S 150 tractor does a better job of **self-loading** than any piece of rubber tired equipment I've seen. Its high production, speed and other rubber tired advantages **really** pay off for me on any hauls of over 400 feet."

Put **your** four wheel scrapers to work behind M-R-S tractors and make them pay off again. Get all the advantages of high speed rubber without the SINGLE PURPOSE CHARACTERISTICS of specialized units. And remember . . . . there is an M-R-S tractor for any size or make scraper up to 20 yards struck capacity.

Write or wire for complete information!

M-R-S 150 speeds down concrete runway to the dumping area after *self loading* the 10 yard struck, 12½ yard heaped scraper.

Short turning circle and high maneuverability of M-R-S 150 is ideal for contractors engaged in the construction of narrow secondary roads.

COMPANY

FLORA AND JACKSON, MISSISSIPPI, U. S. A.

MOVE BIG LOADS

faster, safer, for less!

with *LaCROSSE* trailers

To save costly delays and special handling charges, this ingenious contractor simply drove his La Crosse flat bed *right into the manufacturers' plant* under this huge 12½ ton ready-mix storage silo — lashed it securely into position — and drove it away in a few minutes. You, too, can save time, trouble and money by *doing your own equipment hauling* on job-proved La Crosse trailers. Choice of flat, drop, or tilting platforms—6 to 67 tons capacity. Write for free descriptive literature.

LC-22

Up to 2000 lbs. less dead weight per trailer.

Stronger goose-neck construction.

Safer, more dependable brakes.

Stronger specially-built axles.

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

☐ Rush complete information on La Crosse trailers:
☐ Specifications ☐ Prices ☐ Delivery
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Name.....Title.....
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LaCROSSE

America's Favorite **LOW BED TRAILER**

News from the Field

Change Firm Name

A change in the name of South Florida's oldest construction company was announced the 15th of August. Geo. E. Bunnell, Inc., became the Bunnell-Ludwig Corp. Headquarters will remain at 15151 West Dixie Highway, North Miami, Fla.

Robert M. Ludwig, who bought 50% of the company's capital stock and became president in 1948, will continue in that capacity. George A. Bunnell, son of the man who founded the company in 1911, is executive vice president.

National Safety Council Holds Anniversary Congress

Safety-minded folks — 12,000 of them—will journey to Chicago from all over the world to take part in the 40th annual National Safety Congress Oct. 20-24. The Council is already planning to make this year's Congress something special in celebration of 40 years of steady development in accident prevention.

More than 600 speakers will appear at 200 sessions, covering every conceivable phase of safety. In addition, the Congress exposition will contain about 250 exhibits covering all types of safety aids.

The Safety Council first came into being in October of 1912 when a group of safety engineers for various steel companies met at the Hotel Pfister in Milwaukee in the First Cooperative Safety Congress.

The '52 Congress will emphasize the progress made in accident prevention. The National Safety Council estimates that 500,000 lives have been saved during the 40 years through the efforts of organized safety people.

Repair Quake Damage

Earthquake — that terrifying word flashed through California shortly after dawn on the 21st of July.

Initial damage was estimated at $1.5 million. More than a dozen deaths were due, directly or indirectly, to the tremors. In the wake of the violent earth convulsions at Bakersfield and Tehachapi came the inevitable human misery, disruption of commerce and community paralysis.

Characteristic of the vigorous action taken by Californians to repair the damage was the speed with which the Southern Pacific Railroad cleared four

an ACCO product

The BRAND is mighty important

● This HAZARD brand on wire rope got started in 1846. It's a top brand today not because it goes back 106 years but because Hazard wire rope has kept on improving.

Hazard research and engineering has built more hours of useful work into ropes that carry this brand name. It has experimented with metals and alloys and every known lay. It is working harder than ever today improving the ropes that bear its name.

Hazard's especially proud of its LAY-SET Preformed WIRE ROPE. You can tell it by the green strand. It lasts longer and costs less to use.

ACCO

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

makers of ACCO Registered WIRE ROPE SLINGS

• Fleet of D8 tractors worked two 10-hour shifts daily to repair Southern Pacific Railroad tunnel damage after 21st of July earthquake in California.

debris-clogged tunnels 19 miles west of Tehachapi. Morrison-Knudsen Co., Inc., took the job which required moving an estimated 750,000 to 900,000 cubic yards of earth. Every available contractor and his equipment in the area was hired by M-K. H. L. Leventon, a veteran construction supervisor, was named project manager.

Fifty Caterpillar Diesel tractors, 30 Caterpillar Scrapers and two Caterpillar No. 12 Motor Graders as well as a half dozen Gardner-Denver 500 compressors powered by Caterpillar D1300 engines, participated in the huge project.

First task was to carve out three miles of roadway to permit easy access to the damaged tunnels. Ten Caterpillar D8 tractors with bulldozers wrapped up the job in a half day. Working two 10-hour shifts with approximately 350 men on the job, the emergency task sped to completion. Three of the tunnels were "daylighted" —made into deep cuts. The fourth was salvaged although workers in the restored tunnel were in constant fear that one of the more than 200 "afterquakes" might bring the entire structure crashing down on their heads.

Dewatering 1500' of 8' x 14' deep sewer trench at a river crossing, this 4" Jaeger pump handled 40,000 gph at average speed of only 1200 rpm (10% to 15% lower speed than other pumps), and reprimed quickly, as needed, at 1400 rpm (compared with 1800 to 2000 rpm required to prime ordinary pumps). This is typical performance. Jaeger's larger shells and impellers, double priming action and use of largest engines applicable mean high efficiency, fuel economy, long life — in 1½" to 10" pumps.

See your Jaeger distributor or send for Catalog P-10

THE JAEGER MACHINE COMPANY 553 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY

Gulf Freeway Lanes Opened to Traffic

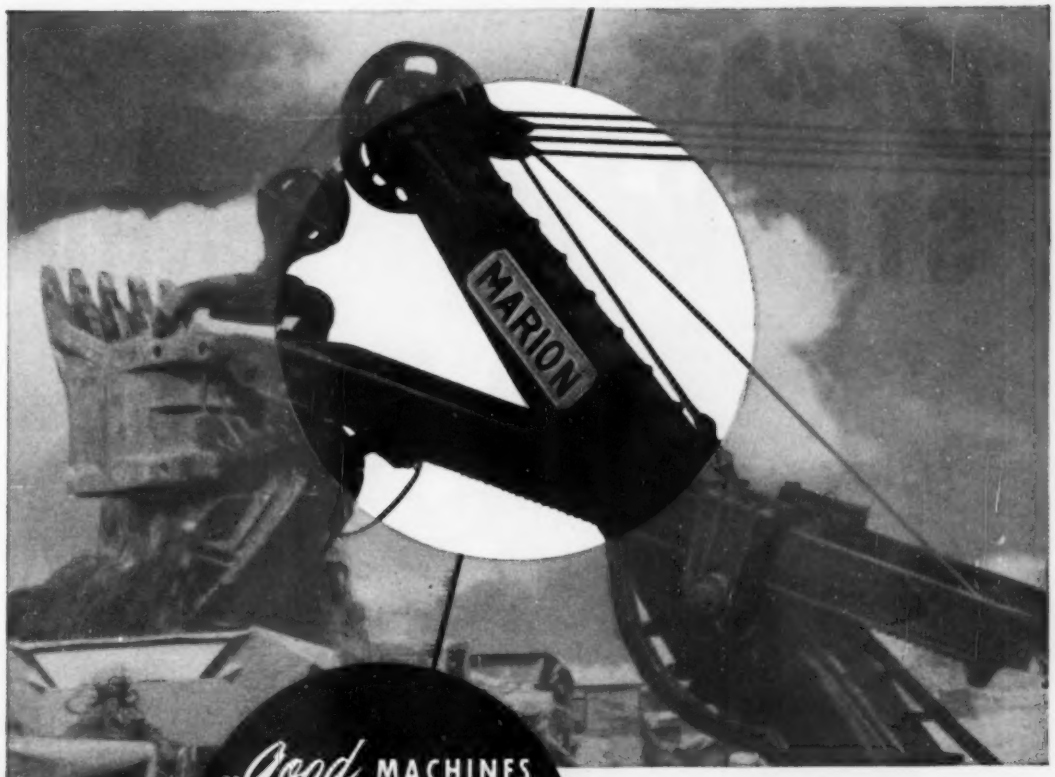
After brief ceremonies at a midway point between Houston and Galveston on the 2nd of August, the $28.5 million Gulf Freeway was opened to a steady stream of traffic.

Lauded by the U. S. Bureau of Public Roads as a model for expressway type thoroughfares, the 50-mile Gulf Freeway is the longest toll free superhighway constructed since the end of World War II. (*Excavating Engineer*, June, 1951, carried an article on the project entitled: "Houston Gives Gulf Freeway a Flying Start."

The opening of the multilane engineering marvel comes after 16 years of planning and six years of actual construction. Principal figure in the historic event which links the two Texas cities so closely was E. H. Thornton, Jr., chairman of the Texas Highway Commission.

In dedicating the Freeway, Thornton said, "When these ceremonies are completed, motorists will be able to travel the 50 miles between Houston and Galveston in 56 minutes. . . . This symbol of progress is a step in the direction of a Texas highway system which will not only provide for the de-

Continued on page 53



..Good MACHINES BACKED BY A Good COMPANY NAME

Men and corporations in the excavating or material handling business today need the very best, most efficient tools they can get.

They need a good name behind their equipment, too, for maintenance and service are a real, inevitable part of our mechanical age.

How GOOD can a machine be? MARION, since 1884, has tried to build the best machines possible within the limits of being practical. Not the cheapest machines, but the best. Not to meet a price, but to do a job.

Any MARION representative can show you how this policy has paid dividends for owners throughout the world in terms of dependable, profitable work over long periods of time.

The thousands of MARION machines in service today and the good friends MARION has in many important industries have helped strengthen our convictions that there will always be a market for machines backed by a good company name.

Write for a copy of our new catalog, No. 403, giving condensed specifications on the complete line of MARION machines.

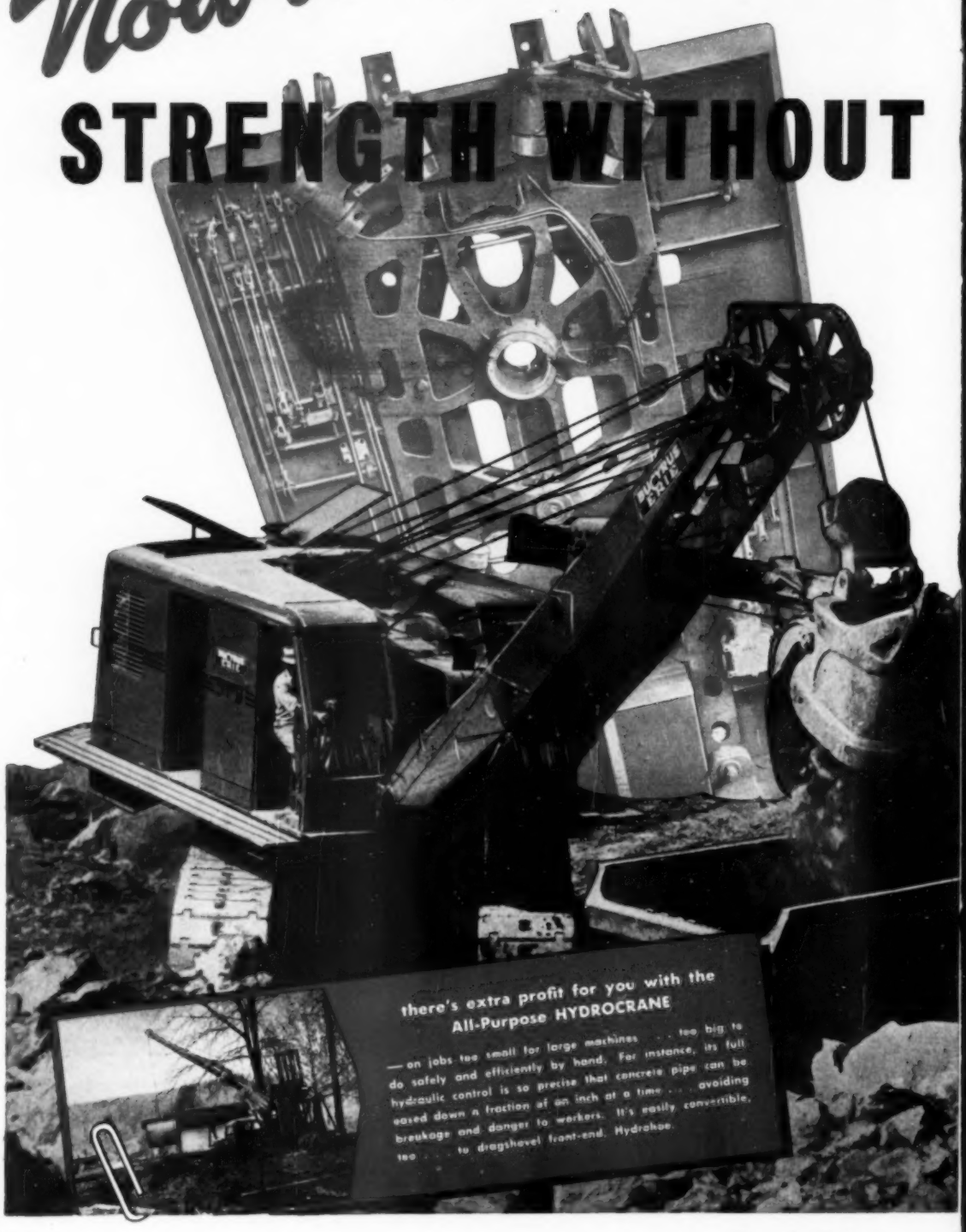
MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES.

from ⅜ cu. yd. to 45 cu. yds.

Now . . .

STRENGTH WITHOUT



there's extra profit for you with the All-Purpose HYDROCRANE

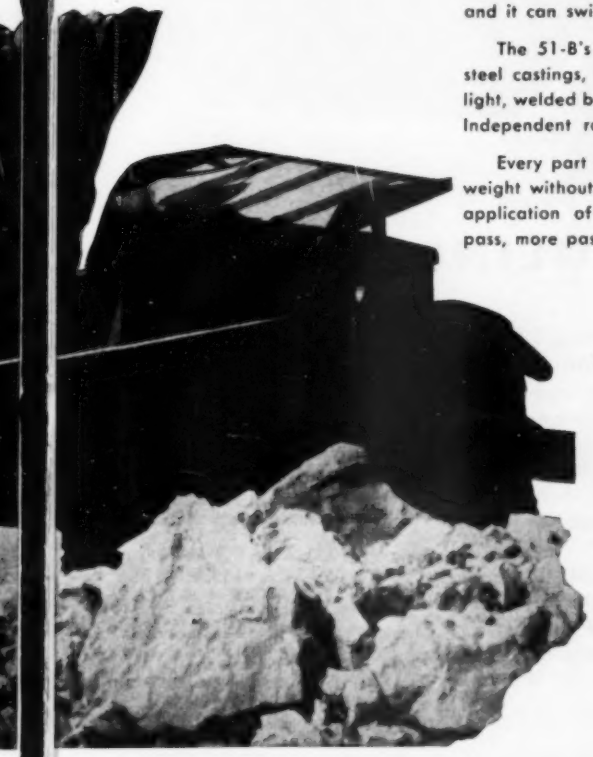
— on jobs too small for large machines . . . too big to do safely and efficiently by hand. For instance, its full hydraulic control is so precise that concrete pipe can be eased down a fraction of an inch at a time . . . avoiding breakage and danger to workers. It's easily convertible, too . . . to dragshovel front-end. Hydrahoe.

DEADWEIGHT . . .

counts more than ever

and it's yours with Bucyrus-Erie's 2-yd. 51-B

⅜ to 4-yd. Gasoline, Diesel, Electric Excavators



HERE'S an excavator that combines built-in durability with weight economy to give bigger output with less maintenance.

For instance, the 51-B's revolving frame is a single box-section casting of annealed steel . . . specially developed and cast by Bucyrus-Erie. This solid "backbone" provides real rigidity for machinery alignment — yet holds weight to a minimum. As a result, vibration is minimized in the 51-B . . . and it can swing fast, work at a profit-building pace.

The 51-B's truck frame and caterpillar side frames are single annealed steel castings, too — for strength with light weight. Boom and handle are light, welded box-sections that provide ample strength for all working stresses. Independent rope crowd eliminates the need for heavy boom machinery.

Every part of the 51-B reflects advanced engineering that cuts out dead weight without compromising strength. This means you get most economical application of power and lowest upkeep — with bigger payloads every pass, more passes every day. 66E52C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Most Compared
Most Preferred

You Can Count on the RED ARCH

in DRAGLINE BUCKETS

Red Arch buckets have what it takes to deliver steady, high output on heavy construction . . . and to stay *on the job.*

One big reason is that they're built of special alloy steels which provide ample strength without excess weight. Another is famous Red Arch design which enables them to load fast and easy . . . carry without bobbing or spilling . . . and to dump quick and clean. Combined with self-cleaning hoist trunnions, heavy-duty runner bars and renewable heel plates, that mean real on-the-job dependability.

Standing up under punishment . . . staying out of the repair shop also means bigger output over the long pull, and lower overall costs. Standardize now on Red Arch buckets and get these big advantages working for *you.* There's a type and size Red Arch bucket for every dragline application . . . ⅜ to 30-yd. Write for complete information.

189R52C

BUCYRUS ERIE

SOUTH MILWAUKEE
WISCONSIN

• Well-decorated overpass, located midway between Houston and Galveston, was dedication site of $28.5 million Gulf Freeway. Over 2,000 persons braved intermittent afternoon thundershowers to witness opening of multi-lane road, longest toll free superhighway constructed in U. S. since World War II.

News

Continued from page 48

mands of today, but also for those of tomorrow. . . . A highway system which means more farm to market roads, more super highways, more modern bridges to replace the narrow and inadequate ones built many years ago, and more urban expressways to relieve traffic congestion in Houston, Dallas, San Antonio and Ft. Worth."

Thornton unveiled a bronze plaque planted by the Houston Chamber of Commerce at the midway point. The inscription reads, "Gulf Freeway. Dedicated to Public Service, Aug. 2, 1952."

The first contract on the Gulf Freeway was let in 1946 for a three-mile section within the Houston city limits. This three mile urban section, plus another six miles which have been completed since, has already carried 252 million vehicle miles of traffic. Only four fatalities have been suffered, making the 1.6 fatalities per hundred million miles compare very favorably with the national average of 7.5 for all types of roads.

Some 99,000 daily users of the Houston end of the Gulf Freeway have already saved 485 million vehicle minutes, which when converted to dollars amounts to $12,190,000. The nine-mile urban section was built at a cost of $15,600,000 including right-of-way costs.

Construction costs on the Freeway were split evenly by the state and federal governments, with right-of-ways paid for by the City of Houston, Harris County and Galveston County.

Some 2,371,628 tons of materials, the equivalent of 47,500 carloads, were used in constructing the Freeway. If the materials were loaded onto a single train, it would be 450 miles long.

Public Works Association President Named

Allan H. Rogers, superintendent of public works, Garden City, N. Y., was named president of the American Public Works Association at its annual meeting in Los Angeles' Shrine Convention hall in August.

As president of the national organization of public works officials, Rogers succeeds Edward J. Cleary, executive director and chief engineer of the Ohio River Valley Water Sanitation Commission, Cincinnati. Cleary remains on the Association's board of directors as immediate past-president.

Newly-named area vice presidents of the Association for a two-year term are Ralph C. Graham, superintendent of construction and public works, Davenport, Ia., central area; Warren A. Cooledge, director of public works, Nashville, Tenn., southern area, (who was re-elected for another two-year term); Edward P. Decher, secretary and purchasing agent, Joint Sewer Commission, Newark, N. J., eastern area (for a one-year term—to fill the unexpired term of Rogers); and Milton Offner, secretary of the board of public works, Los Angeles, Calif. continuing the term to which he was elected last year.

Jean L. Vincenz, director of public works, San Diego County, San Diego, Calif., and George G. Hyland, commissioner of public works, Boston, Mass., were each named for a two-year term as directors of the Association. Continuing as directors are Sol Ellenson, director of public works, Newport News, Va., and J. J. Dean, Albany, Ga.

Albert G. Wyler, city engineer, New Orleans, La., was elected treasurer succeeding Decher, who was elevated to vice-presidency.

Available with Pneumatic Tires Tires, Steel Wheels or Skids
40 M (40,000 G. P. H.)
RICE
Self-Priming
CENTRIFUGAL PUMPS
Engine, belt, and electric driven pumps with many new features to give you low cost, dependable performance. A. G. C. rated. Easily replaced wearing parts keep Rice Pumps young at low cost.
Write for special bulletins.
RICE PUMP & MACHINE CO.
234 N. 12th Ave. Grafton, Wis.

What's the capacity of this block?
If you don't know.. don't use it!
Specify AMERICAN CROSBY
Load-Rated!
BLOCKS
Safe working capacity embossed on side plate
DISTRIBUTORS EVERYWHERE
AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

GRAVITY DUMP eliminates

SIMPLE BODY-RELEASE LEVER WORKS INSTANTANEOUSLY

1 Body release lever is located at steering wheel, no reaching or stretching. Lever engages trip rod on Dumptor body . . .

2 Trip rod instantly releases latch hooks from body latch seat on the Dumptor chassis frame. Gravity dumps the load . . .

3 Body rolls on heavy-duty rockers. Snub chains attached to big coil-spring shock-absorbers check body at 70-degree tilt.

KOEHRING HEAVY DUTY

body hoists

Koehring Dumptors have no slow-working body hoists. You trip the release lever and gravity dumps the 6-yard load in one second.

Cuts maintenance costs . . . there are no complicated mechanical hoists to slow up haul cycles . . . no expensive hoist replacement parts, maintenance or down time to eat into your profits. And gravity dump is always instantaneous, trouble-free in all temperature extremes . . . never wears out.

No spring maintenance is another money-saving advantage you get with Koehring Dumptors. There is just one big, double-coil chassis spring on steering axle . . . none on driving axle. Big shock-absorbing drive tires eliminate need for more springs . . . save spring maintenance time and replacement costs.

Check your body hoist and spring maintenance costs for a year . . . see how much you will save when you haul with heavy-duty Dumptors. In addition, Koehring constant-mesh transmission gives Dumptor the same 3-speed travel forward and reverse for "no-turn" shuttle hauling . . . increases production and your profits.

Get complete facts and figures from your Koehring distributor . . . or write to us for informative 28-page Dumptor® catalog.

KOEHRING CO.

Milwaukee 16, Wis. Subsidiaries:
PARSONS • KWIK-MIX • JOHNSON

CR234

JOHNSON *big-payload* CLAMSHELLS

Fast-cleaning

. . . smooth, inside and out, Johnson all-welded clamshell buckets dig and dump with least resistance. They are quick-filling, easy-closing because big needle-bearing-mounted sheaves reduce friction loss, deliver full digging power to lips, teeth. Hard manganese cutting edge toughens with use, assures capacity payload every bite.

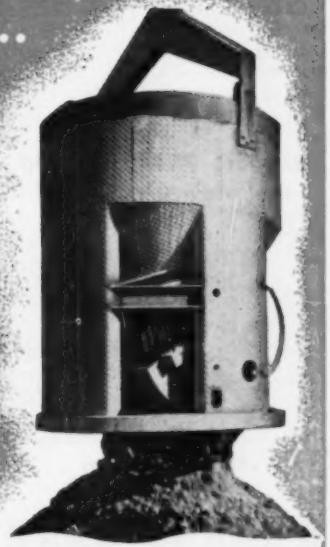
3 TYPES, 10 SIZES . . . ⅜ TO 3 YDS.

General-Purpose, Wide-Rehandling, Heavy-Duty-Digging types . . . 10 sizes from ⅜ to 3 yds., offer maximum yardage performance, long bucket life on all of your material-handling jobs.

LO-SLUMP.....
CONCRETE BUCKETS

handle any stiffness of concrete, have built-in air vibrator, steep interior slopes. Extra-large, double-clam discharge gates can be operated manually, or by air rams. Sizes: 2, 3, 4, 6 and 8 yds., all engineer-approved. 8-yd. Johnson Lo-Slump is available with single compartment, or two 4-yd. compartments with independent dual discharge arrangement. Johnson line also includes many other bucket sizes, types for large aggregate concrete and normal slump concrete.

W12



FOR COMPLETE FACTS, WRITE TO:
C. S. JOHNSON CO., Champaign, Ill.

☐ Send us new clamshell bucket catalog. ☐ Send information on concrete buckets.

NAME _____ TITLE _____

COMPANY _____

STREET _____

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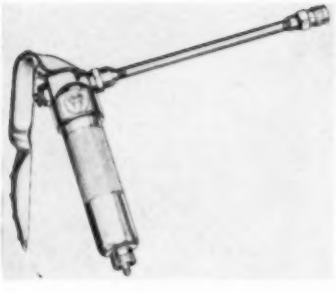
JOHNSON INC PRODUCT

C. S. JOHNSON COMPANY
Champaign, Illinois

KOEHRING SUBSIDIARY

Equipment

You Ought to Know About



Booster Gun

Manufacturer: Lincoln Engineering Co., 5702-60 Natural Bridge Ave., St. Louis 20, Mo.

Claims: This new gun is designed for the following applications: (1) Lubrication of bearings on industrial machinery requiring injection of a small quantity of lubricant at extremely high pressure. (2) An auxiliary high pressure lubricator to service bearings requiring injection of limited quantities of special purpose lubricants. (3) Cracking "frozen" or clogged bearings on contractors' equipment without use of power-operated gun.

The gun provides a complete range of pressures up to 10,000 psi. Easy one-hand push action eliminates fatigue—weighs only 2 lbs. Long, hydraulic coupler extension permits reaching deep-seated and hard-to-reach fittings. It handles all pressure gun lubricants in any weather. Holds 2½ ozs. and can be refilled in seconds by engaging filler fitting on gun with control valve on hose from power—or manually operated pump. The gun can be cleaned by removing only one outlet check with no packings to replace.

Exhaust Protectors

Manufacturer: Canton Cast Products Co., Canton 9, O.

Claims: An improved exhaust protector is known by the trade name—"Cancap." Exhaust protectors were developed to keep rain, snow, sleet, dirt and insects from entering the vertical exhaust pipes of engines of all types.

The cap is a lightweight cast aluminum alloy fused around the top of a malleable tear-shaped hinge. The extra lightness enables the cap to open with the first puff of the exhaust, as well as strengthening the hinge itself.

A wider opening action is gained by using a cadmium plated set-screw with shakeproof washer as the pin of the hinge. Another feature is the malleable mounting bracket. Simply slipped over pipe, it is held by cadmium plated set-screw—needing no collar, clamp or bushing.

Smallest size fits pipe 1⅜ to 2⅜ inches. Four other sizes fit pipe to 5-in. O.D.

Lamp Holder

Manufacturer: Stonco Electric Products Co., 333 Monroe Ave., Kenilworth, N. J.

Claims: A weatherproof lamp holder is identified as the Stonco Cushion-Seal Holder.

The new type of holder makes use of a high temperature, silicon rubber

cushion-seal that hugs the neck of the lamp in a tight weather-proof seal. The lamp is sealed low at its neck and its hot spot area is exposed to air.

The cushion-seal adapts itself to fit

Riggers PLAY IT SAFE on "high wire" jobs!

...that's why they demand GENUINE

CROSBY CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners

SIZES FOR ¼" TO 3" WIRE ROPE

DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

DREDGES

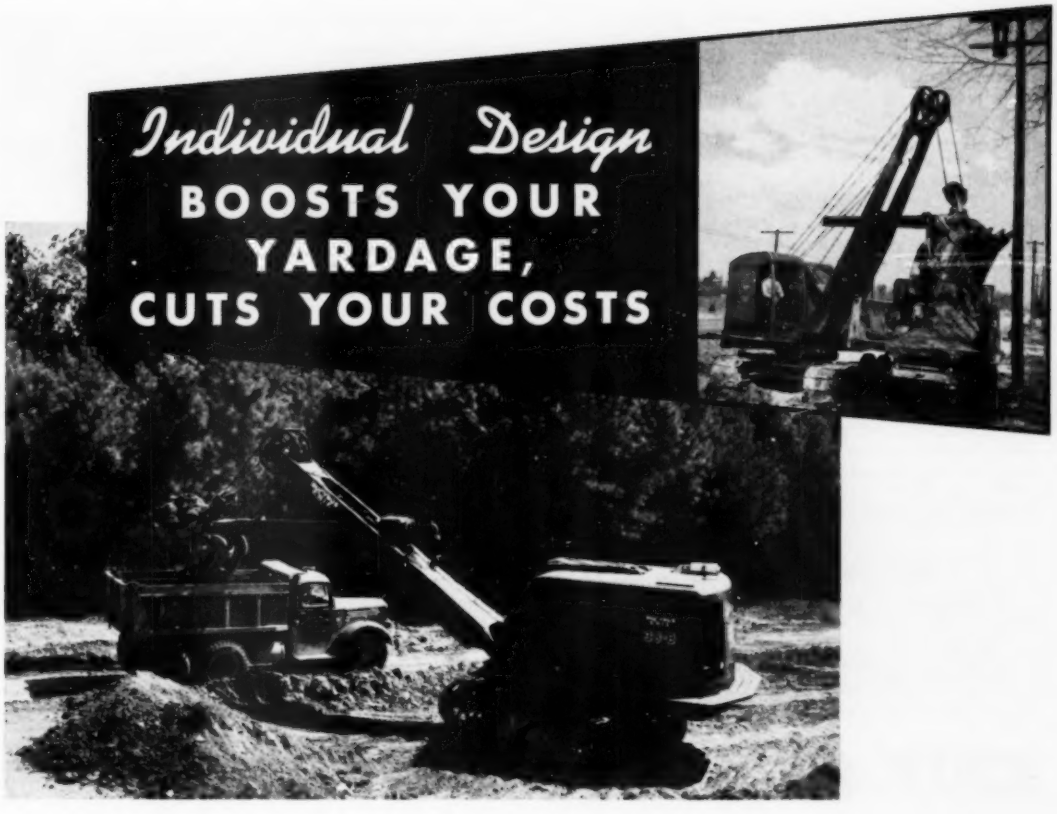
HYDRAULIC DIPPER CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 - INDIANA - U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905



Save That "Rationed" Excavator — Keep Adjustments Right

It's a wise owner who keeps his machine in tiptop running condition. Take a few minutes each day to check such things as brake and clutch adjustments, boom angle, dipper trip, crowd rope or chain, cat belts, drive chain and operating levels.

IT REALLY PAYS OFF.

FOR top efficiency an excavator should be designed to match size, engine horsepower and overall weight with the capacity of the dipper. That's exactly how Bucyrus-Erie excavators are built. Ask for a ¾ yd. shovel and you get a ¾ yd. shovel from boom point to crawler tread. No makeshifts, no balance-destroying switchovers. Each of the seven Bucyrus-Erie gasoline, diesel or single-motor electric models from the ⅜ to the 4-yd. is designed as an entirely separate machine — and is a proven yardage leader in its field.

Maintenance costs are lower, too. With just the right combination of power, strength and weight, there's no over-stressing of gears and shafts — none of the excessive wear that comes with so-called dual capacity outfits.

Individual design heads the list of many reasons why Bucyrus-Erie excavators stand out on roadbuilding and other construction jobs. Get the complete and convincing story from your Bucyrus-Erie distributor.

201E57

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

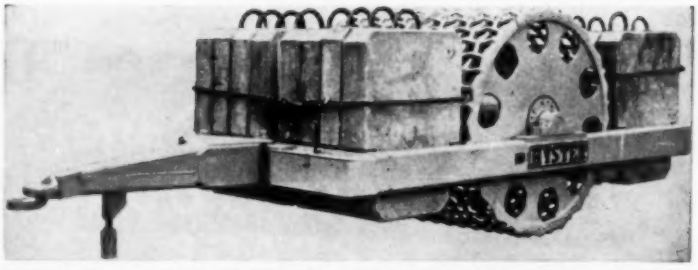
all R-40 and PAR-38 lamps whether long, short or off-center. By cradling the lamp in a rubber cushion grip, the cushion-seal protects the lamp against traffic vibration, pole sway, shock and other conditions contributing to early lamp failure.

The new unit is made of non-corrosive cast aluminum with a glazed porcelain heatproof socket. The silicon cushion-seal is backed with an impregnated asbestos heat barrier and locked in place by a rigid aluminum reinforcing disc. The unit is completely wired with lead wires extending beyond a universally adjustable swivel arm that is threaded ½ in. IPS for mounting ½-in. pipe, wall bracket, pipe slip fitter, or a number of standard interchangeable splice box accessories. It carries UL and CSA approval for use with a medium base or mogul reflector lamps in the standard 150W, 200W, 300W, and 500W sizes now made by all major lamp manufacturers.

Grid Roller

Manufacturer: Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore.

Claims: An entirely new method of economical bituminous highway salvage and repair is now possible by means of a tool called the "Grid Roller." This new tool is designed for towing behind a motor grader or tractor and is based on the latest techniques and knowledge gained from actual field experience in the past three years.



The roller solves the problem of salvaging bituminous roads, regardless of age, by its three-way action. It disintegrates the old mat material, compacts the base and rolls the new surface.

In the new grid roller two methods of counterweighting are available to increase its adaptability:

Standard counterweighting: The grid roller may be counterweighted with reinforced concrete, T-shaped weights weighing about 1,125 lbs. each, shaped to fit in slots in the frame which will hold up to 16 pieces. By changing the number of concrete sections the total weight can be varied according to the requirements of the particular operation.

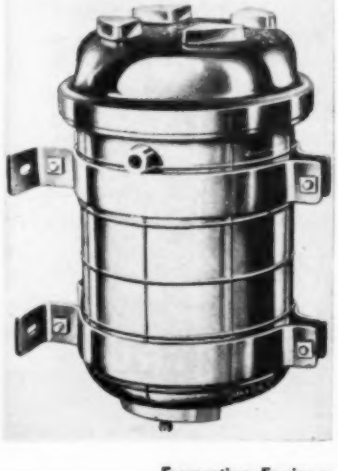
Optional counterweighting: Available as optional equipment is a set of counterweight boxes with total capacity of about 16,550 lbs. of scrap metal. The grid roller so equipped has an approximate gross weight of 30,000 lbs.

The wheels are on two independent shafts, which allows the two wheel sections to be serviced separately. The wheels are designed with large openings in the wheel plates at the rim to allow material that has worked its way through the grid opening to fall out. No cleaners are needed.

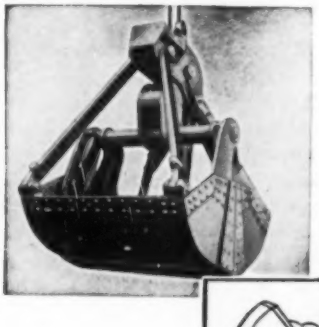
Oil Refiner

Manufacturer: Oilpure Refiner Sales Co. of New York City, 507 Fifth Ave., New York, N. Y.

Claims: The Oilpure refiner is designed for all types of Diesel, gasoline, truck, tractor, automotive, and stationary engines. Containing no moving parts, the refiner cannot interfere with the operation of the engine. Universal in construction, the various models may be transferred from one engine to a similar one. They may be installed on the dash, under the hood, or on the engine itself.



ERIE *Barge Type* Bucket



In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.

***Compare* DECK AREA**

¾ Yd.	27.21 Sq. ft.
1 Yd.	30. Sq. ft.
1¼ Yd.	32.3 Sq. ft.
1½ Yd.	38.7 Sq. ft.
1¾ Yd.	42.4 Sq. ft.
2 Yd.	45.1 Sq. ft.
2¼ Yd.	53.5 Sq. ft.
2½ Yd.	57.6 Sq. ft.
3 Yd.	60.9 Sq. ft.

Write for Catalog **2L-2** *Today*

ERIE
STEEL CONSTRUCTION COMPANY

4210 GEIST ROAD • ERIE, PENNSYLVANIA

Here's why Schield Bantam is now WORLD'S LARGEST PRODUCER of truck-mounted cranes & excavators!

So many owners are making so much money with Schield Bantam equipment that today this young, fast-growing company produces *more truck-mounted cranes and excavators than any other manufacturer.* In 1951, Schield Bantam also outproduced all other manufacturers of less than ½ cu. yd. excavators COMBINED (including crawler types).

More value per dollar!

Reasons for Bantam leadership are easy to understand. First, Schield Bantam has specialized in developing just *one size* machine, with a complete line of *specially engineered attachments.* By mass-producing this one size unit with modern "assembly-line" methods, Schield Bantam is able to give you *the world's simplest, fastest ⅜ cu. yd. excavator — at the lowest price in the industry!*

Job-proved capacity

Today, over 3500 truck-mounted Bantams are cutting costs on jobs all over the world. Bantam shovels and draglines load pit run material at 90 cu. yds. per hr. Back Hoes dig 100′ of trench per hr. (5′ depth). Cranes, with 25′ to 50′ booms, speed handling of loads up to 5 tons.

Why *pay more* for a machine that can't *earn more!* Let us prove Bantam's economy on your work today.

58-G-4C

SCHIELD BANTAM

First in truck-mounted

Power shovels • Cranes • Draglines • Back Hoes

OK'd for military use!

A new lightweight Bantam shovel-crane, suitable for airborne operations, and other applications impractical for larger machines, has now been standardized by the U. S. Military. Weighs less than 9 tons complete with new 6 x 6 Ordnance truck.

OK'd by prominent users!

American Terrazzo Co. • Bureau of Reclamation • Dept. of Interior • City of Detroit • Dunn Brothers • Gulf Oil Corporation • Morrison-Knudsen • Northern Pacific Railroad • Ohio Fuel Gas Co. • U. S. Forest Service • U. S. Vanadium Corp. • Williams Bros.

OK'd by top distributors!

Bantams are sold and serviced by a world-wide network of 110 leading distributors. This specialized experience in ⅜-yd. application and maintenance is quickly available wherever you go.

MAIL COUPON FOR FULL DETAILS

SCHIELD BANTAM CO.
202 Park St., Waverly, Iowa, U.S.A.

We are interested in the BANTAM
☐ **Literature** ☐ **Free demonstration**

Name_____
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Company_____
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City_____ **State**_____

New trade literature

Subject: **Welding Slide Rule**
Content: A new, 9-in. welding electrode comparator slide rule which permits a comparison of General Electric welding electrodes with those of other electrode manufacturers has been made available. Designated GEN-37B, the handy slide rule provides an electrode comparison in a matter of seconds as the operator designates a choice for comparison.
Where to Get: G-E Welding Distributors.

Subject: **Legal Guide**
Content: *Legal Guide for Contractors, Architects and Engineers*, a new book by I. Vernon Werbin, discusses 83 cases of contract litigation and gives sound advice for minimizing these legal headaches. The author is both a licensed professional engineer and a practicing lawyer. Out of this unique experience he explains the rights in litigation of contractors, architects and engineers, and tells what steps must be taken to preserve these rights. He not only shows how to deal with specific types of legal problems when they do occur, but also specifies how to prepare contracts that won't cause trouble. Prior to writing the guide, Werbin researched all reported cases involving construction, engineering and architectural contracts handed down by every court in the U. S. Pertinent contract provisions, the court's decision, and the basis for the decision are given for each of the 83 cases selected for this book. For this reason, the guide though written for laymen, is equally valuable to lawyers who handle engineering and construction litigation, since each principle of law set forth is sustained by a case citation. A detailed index of subjects covered completes the book. Much of the author's 35 years' law practice has been in contract litigation. After 17 years work as an engineer, mostly in connection with New York City's subways, he was admitted to the bar in 1917, and at that time became counsel for the Bradley Contracting Co.
Where to get: McGraw-Hill Book Information Service, 327 W. 41st St., New York 36, N. Y. ($4.75)

Subject: **Specification Booklets**
Content: Three new specification booklets showing detailed information on the new ¾-yd. Models 75A and 75B excavators and the 75BT truck crane illustrate capacities, ranges and dimensions. Additional information on power plants; the right angle drive, the most efficient method of power transmission; travel speeds and controls are contained in this manual to help contractors select the right unit for their job.
Where to get: Customer Service, Gar Wood Industries, Inc., Wayne, Mich.

Subject: **Air-Entraining Agent**
Content: A new folder describing the advantages of using Vinsol air-entraining agent in concrete briefly lists the advantages of air-entrained concrete and the methods employed in its production. The use of neutralized Vinsol solution is covered in a series of questions and answers. The leaflet points out that solutions of neutralized Vinsol can be obtained from numerous companies in all parts of the country. A list of these suppliers is included in the leaflet. Vinsol, an economical resinous

Photographs at right show a 2-cu. yd. Sauerman Cableway in New Zealand making a river excavation 600 ft. long and 50 ft. deep for dam and powerhouse foundations. Bucket dumps at narrow point in gorge where bulldozer spreads material to form a cofferdam. Cableway operates 20 hrs. per day, with a peak hourly output of 90 cu. yds.

SAUERMAN
Slackline Cableways

Long-reaching Sauerman Slackline Cableway Excavators stretch out across water, bog, sludge, or deep pits to pick up a load practically at finger-tip command. Only one man—sitting in a comfortable operating station overlooking the work site—is required to dig, haul, lift, and dump in a perfectly controlled non-stop cycle. Need for sending men and equipment to soft surface areas or hazardous locations is eliminated. A single machine, operated from an entirely safe position, does the complete job quickly and efficiently.

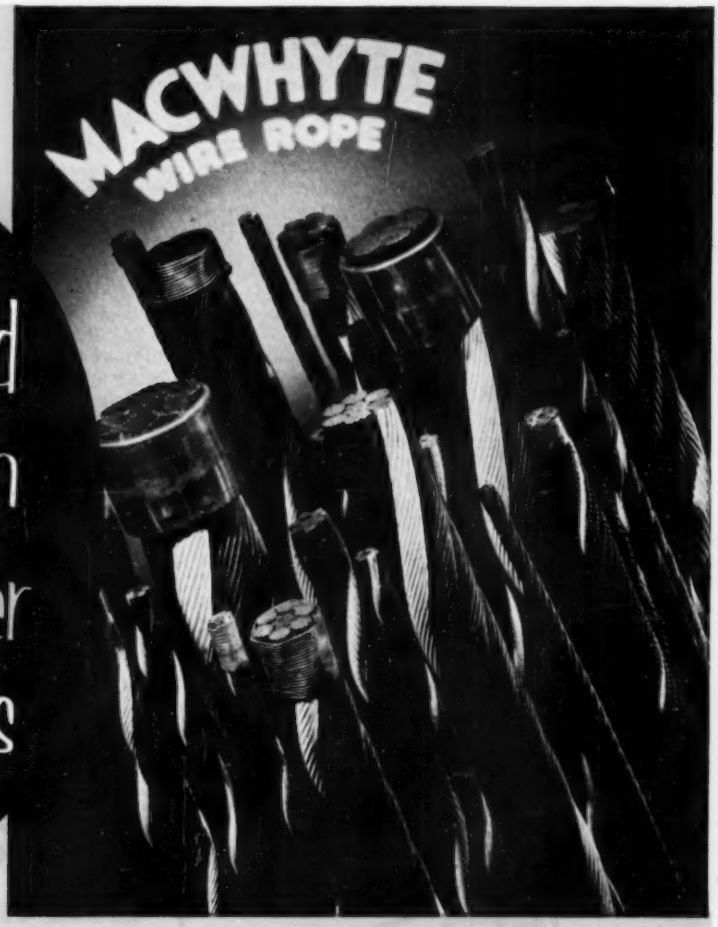
From an economy standpoint, the one-man Sauerman Slackline Cableway is unsurpassed in its field of use. Labor and equipment costs are held to a bare minimum. Simplicity of design, plus the fact that only the most expendable parts come in contact with the material handled results in exceptionally low maintenance costs. Power consumption, gasoline, diesel, or electric, is moderate. All these facts add up to greater efficiency, speed, and economy of operation.

For complete facts, engineering data, etc., on Sauerman Slackline Cableway Excavators, send for Sauerman Catalog C. Fully illustrated.

SAUERMAN BROS., Inc.
574 S. Clinton St., Chicago 7, Illinois

Cableway and Scraper Specialists Since 1909

You helped design these better ropes



The needs of *your* particular job dictate the design and construction of Macwhyte Wire Rope. Over the years, Macwhyte engineers have kept in close touch with wire rope users in every field. Their experience — and yours — is combined to help produce rope that will give maximum performance . . . not just adequate performance.

Let us help you get the utmost in wire rope performance on your particular equipment. For prompt, accurate recommendations . . . . . call a Macwhyte distributor or write direct to Macwhyte Company.

MACWHYTE COMPANY

2903 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles. Distributors throughout U. S. A.

A thousand and one *wire ropes*
PREformed and internally lubricated
Ask for Catalog G-15

1028

product, was the first air-entraining agent permitted by A.S.T.M. for the production of Type 1A cement, and Vinsol neutralized with caustic soda meets all the A.S.T.M. and federal specification requirements for air-entraining agents.
Where to get: Hercules Powder Co., Wilmington, Del.

Subject: **Pipeline Trenchliner**
Content: Parsons Pipeline Trenchliner is described in a new 4-page bulletin. Designated as the Model 215 Trenchliner, this new wheel type unit digs in a range of 30 digging feeds, from 6.2 inches to 18½ fpm., 13 to 31 inches wide and up to 6 feet deep. According to the new catalog, the trencher is equipped with standard tractor crawlers and self-cleaning lug type shoes. Treads are 18 inches wide and equipped with replacable links, pins, and sealed bearing mounted crawler rollers. A series of actual field photographs, included in the bulletin, demonstrate these other features: Friction clutch control of digging wheel; self-sharpening "Tap-In" digging teeth; and the shiftable and reversible spoil conveyor for discharging material on either side of the machine. All main gears are enclosed and running in oil to assure dependable performance. Shaft openings are dirt sealed and a choice of 2 standard make 55 hp Diesel engines is available.
Where to get: Parsons Co., Newton, Ia.

Subject: **On-The-Job-Applications**
Content: A new and profusely illustrated 4-page folder features on-the-job applications of the truck-mounted Bantam. The new folder presents actual job applications and production records of owners, with illustrations of their machines in operation. The variety of job records contained in this folder illustrates the versatility of the machine which can be used as back hoe, pile driver, clamshell, dragline, shovel, crane, magnet crane and with various grapples.
Where to get: Schield Bantam Co., Waverly, Ia.

Subject: **Heavy Duty Excavator**
Content: Just off the press is a new bulletin on the Harnischfeger Corp. Model 955-A machine in the 2½-yd. class. Numerous photographs of the 955-A working on many projects throughout the country are supplemented in the 40-page, two-color booklet with close-up pictures and data describing the features of the excavator. Special mention is given to the exclusive Magnetorque swing. This model, a leader in the 2½-yd. category, is described as easily convertible for service as a shovel, dragline, clamshell or crane due to the split sprocket and drum lagging arrangement which eliminates the need for auxiliary shafts, gears and sprockets. For heavy duty crane work the 955-A has lifting capacities up to 60 tons with maximum safety, while as a shovel the model is adaptable for tough rock-removal jobs.
Where to get: Harnischfeger Corp., Large Excavator Division, Milwaukee 46, Wis. (Bulletin X122-1)

Subject: **Maintenance Guide**
Content: Maintenance practices are simplified for operators of Cat DW21, DW20 and DW10 tractors in a new multi-colored cartoon-type booklet. The 24-page handbook (Form 30275) will be available in English, French, Spanish and Portuguese. Using scenes familiar to the operator, the booklet discusses factory-prescribed techniques in caring for wheel-type tractors. Reduction of repair bills and elimination of "down time" is the purpose of the booklet which deals with many specific procedures in connec-

Dragline, Clamshell, Custom-Built Buckets Stone and Wood Grabs

WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts? Write for free descriptive bulletins

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

tion with routine engine maintenance.
Where to get: Caterpillar Tractor Co., Peoria 8, Ill.

Subject: **Ditch Bridge**
Content: "Ditch Bridge," a new, time and labor saving magnesium bridge designed especially for supporting

trucks and other similar rubber-tired vehicles over culverts and ditches, is described in Bulletin DB-1-452. The bulletin covers applications, load limits and dimensions. A convenient specification sheet—order blank has been included in the bulletin.
Where to get: Magnesium Products of Milwaukee, 748 W. Virginia St., Milwaukee 4, Wis.

Subject: **Motor Grader**
Content: A new folder has been released describing the Adams Motor Grader No. 512. Among features listed is the rubber mounting of the IHC-UD-14A engine, and an increase in rated horsepower from 76 to 85.
Where to Get: J. D. Adams Manufacturing Co., Indianapolis, Ind.

Subject: **Skid-Shovel**
Content: If you're engaged in earth moving you may be interested in the large two-color folder announcing three models of the new Drott Skid-Shovel for International tractors. The models: 1¼-yd. for TD-9; 2-yd. for TD-14A; and 3-yd. for TD-18A. The folder outlines Drott features such as break-out action, Hydro-Spring and high lift, far pitch. The folder notes that the digging power of the Drott Skid-Shovel is greater than the weight of the tractor. A pressure line running from the main lift rams to the Hydro-Spring puts the hydraulic system under spring tension. Hydraulic shocks, common to every front-end loader, are cut to a third of their normal force. Pictures, sketches and specifications are included. Specific applications are suggested in the folder.
Where to Get: Drott Manufacturing Corp., 3841 W. Wisconsin Ave., Milwaukee 8, Wis.

Compare Rogers trailer specifications with others and study Rogers special features of construction. You're certain to be impressed.

Much equipment included with standard Rogers trailers is considered extra in other makes. In fairness to yourself, consider every detail of the trailer you buy . . . you'll choose a ROGERS.

To the best of our knowledge, only Rogers uses alloy steel in the main carrying members of the frame. This is your insurance against the possibility of unintentional overload damage. Write for the Catalog.

YOU GET MORE FOR YOUR MONEY *in a* ROGERS TRAILER

EXPERIENCE *builds 'em* — PERFORMANCE *sells 'em*

ROGERS BROS. CORP.
ALBION, PENNA.
136 Orchard Street

A Rogers Type "D" Trailer
Export Office: 50 Church St., New York 7, N. Y., U. S. A. Cable Address: Brosites

NOT in the *Contract*

A motorist and his wife traveling through the Blue Ridge Mountains stopped at a one-pump gas station before a mountaineer's cabin. After the man told the proprietor to fill the tank, his wife asked: "Is there a rest room here?"

"No Ma'am, there isn't," replied the gas man, "but you'll find a mighty comfortable rocker up there on the porch."

Friend: "My good man, why don't you take the train home?"

Drunk: "It's no use, my wife won't let me keep it in the house."

Driving up to the house to deliver the family's seventh baby, the doctor almost ran over a duck.

"Is that your duck out there?" he asked.

"It's ours, but it ain't no duck. It's a stork with his legs wore down."

He took her hand in his and gazed proudly at the engagement ring he had placed on her finger only three days before.

"Did your friends admire it?" he asked tenderly.

"They did more than that," she said. "Two of them recognized it."

"One of the new prisoners has been made editor of the prison publication."

"Well, he'll certainly be able to say a lot in one sentence."

Scientist: "From our studies we find that other planets may not be able to support life."

Hardworking Business Man: "It isn't exactly easy on this one either."

"Won't you join me in a cup of coffee?"

"You get in first."

Wife: "Why do you always flirt with the waitresses?"

Husband: "I'm playing for big steaks."

A British admiral was aboard his flagship in a Mediterranean port when a cruiser made a sloppy job of tying up at her berth. The cruiser's captain dreaded the message he knew would come from his commander-in-chief. He was relieved, if puzzled, when it was delivered. It consisted of the one word, "Good."

Fifteen minutes later the captain was interrupted in his bath with a supplement reading, "To the previous message please add the word, 'God.' "

"Here are my figures for the new job! I'd like to see that Acme outfit outbid us *this* time!"

An engineer walked into a fur emporium with a gorgeous blonde on his arm and demanded something expensive to hang on the curvaceous creature.

They yanked out something for about $500 and he rejected it with a snarl. "What alley cat did that come from? Bring me something nice."

Next came a $5,000 number, then a $10,000, but with each offering his demands grew louder for something better, much better.

So finally they dug up the key to the vault and brought forth a coat worth about $2 less than a king's ransom.

"Now that's fine," said the engineer, as his companion stared goggle-eyed at the creation. "Here's my check. You investigate at my bank to make sure it is good and I will be back Monday for the coat."

But Monday when he returned, he found the store manager in a purple passion. "You fraud! You cheat! The bank never heard of you! If you want that coat you'll have to pay for it in cold cash."

"Oh, but I didn't come after the coat," said our hero. "I came to thank you for a wonderful weekend."

A steelworker's wife, tired of waiting up for her husband, locked all the doors and retired for the night. Before long she heard a loud knocking on the front door.

She opened the window and asked her husband where he had been spending the evening.

"I've been at the Men's Club, dear," he began. "Telling the boys about the strike."

"Then you can go right back," came the reply, "and tell them about the lockout."

"I can't marry him, Mother. He's an atheist. He doesn't believe in hell."

"Marry him, dear—and between us we will convince him he's wrong."

Richard: "Mother, may I have a dime for the old man who is crying outside?"

Mother: "Yes, dear, but what is the old man crying about?"

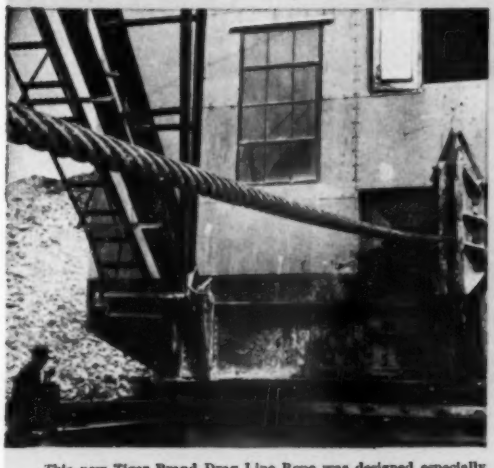
Richard: "He's crying, 'peanuts, ten cents a bag.' "

"Have you seen Faith's new evening gown?"

"No, what does it look like?"

"Well, in places, it looks quite a bit like Faith."

The Proper Rope *plus* Proper Maintenance



This new Tiger Brand Drag Line Rope was designed especially to resist the extremely severe operating conditions encountered in this class of service. On one job where ropes lasted an average of 600 hours, this Tiger Brand Drag Line Rope was still going strong after 1100 hours—believe it or not!

Equals Longer Rope Life Lower Rope Costs

● Many prominent users of wire rope have found they can reduce wire rope costs as much as 50% by using a wire rope designed for the job. They get better rope service at lower rope cost by following this simple, job-tested system, with the help of the Tiger Brand Wire Rope Specialist.

Let this qualified expert make *sure* that you select, for each job, a wire rope that is strong enough to carry the load with an ample margin of safety . . . able to stand incessant flexing and sharp bending without failure of wires due to fatigue . . . built to take the most severe abrasion and crushing. Then make sure that every foot of wire rope you own is inspected, cleaned and lubricated *regularly*.

Engineers and contractors who follow this procedure tell us that they are getting twice — sometimes three times—the life they expected from Tiger Brand Wire Rope, plus greater safety for crews and equipment and freedom from rope-caused work stoppages, all of which means important money savings.

When you are in the market for wire rope, make full use of the engineering knowledge of an expert who has made a life-work of analyzing and solving wire rope problems. Just drop us a line and your Tiger Brand Wire Rope Specialist will be glad to consult with you. Meanwhile, why not send in the convenient coupon for a copy of our latest book?

More than a million tons of oyster shells have been converted into chemicals at this plant. The owners have found that Tiger Brand Wire Rope stands up best under these severe abrasive conditions, cutting rope costs, reducing down time and keeping equipment at top capacity.

SEND FOR THIS NEW BOOK. It contains specification data that will help you select the right rope for each application. In descriptive text, illustrations, diagrams and tables, it gives you complete information on types of rope, diameters, working loads and safety factors for all sorts of rope service.

American Steel & Wire
Rockefeller Building, Dept. E-10
Cleveland 13, Ohio

Please send me your new book, "Specification Data, Tiger Brand Wire Rope."

Name.....

Company.....

Address.....

City.....Zone.. .State.....

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

BUCYRUS ERIE 6 YARD

150-B Brings POWE

NEW SPEED, R, CAPACITY

to loading and stripping

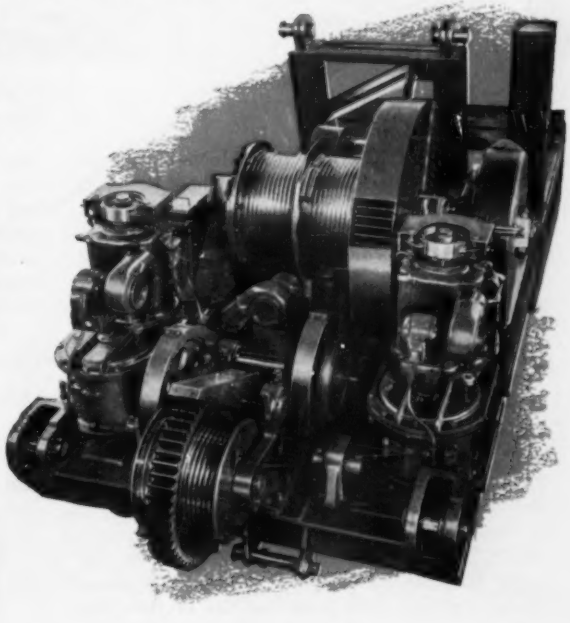
ADDED to the time-proved superiorities of design and construction which have made Bucyrus-Erie quarry and mining shovels traditionally "years ahead" are important features new to an excavator of this size, yet *thoroughly proved in the field*. Among these 150-B features are:

Exclusive Two-Section Boom with tubular dipper handle free to rotate in saddle block. Used with outstanding success on Bucyrus-Erie's large stripping shovels, this design speeds the working cycle and permits increased *payload* because it reduces front end weight materially yet provides enormous strength. Upper section carries only load resulting from pull of ropes, strong trussed lower section transmits directly to the revolving frame the vibrations, torsional and shock loads set up in digging. Rope crowd is quiet, positive, with crowd machinery located on the deck.

Powerful New Main Machinery designed for double twin hoist smoothly delivers power where you want it, when you want it. Hoist machinery pulls dipper straight through tough banks with steady positive action. Fast, smooth swing, with quick acceleration and deceleration, shaves seconds off every cycle.

Larger Stronger Mounting has new propelling machinery arrangement, which provides rapid engagement of the propel for fast move ups. Cored box-section tread links have separate flame hardened wearing paths for rollers and driving tumblers. Cat belts have high wear resistance, stay in adjustment for long periods.

The 150-B has full Ward Leonard independent motor control, is fully convertible to dragline service, features numerous other design advances that make it truly "years ahead". 11-52C



BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

"We're keeping on schedule!"

Just south of California's Half Moon Bay, Contractors Snodgroth, Archibald & Ebright of Redwood City tackled a tough highway realignment job. 165,000 cu. yds. of wet, sandy clay had to be moved to take four sharp turns out of the two-lane road. Five "Caterpillar" DW10 Tractors with No. 10 Scrapers took over. They got 3,200 yards out every 9-hr. day, moving that tough material 750 feet. D7 and D8 Tractors and No. 12 Motor Graders were also on the job.

Superintendent Don Westbrook reports: "We're keeping on schedule with our 'Caterpillar' equipment. The DW10s' speed sure helped on this job, with our 1,750,000 station yards of overhaul, 500 feet of free-haul. They fit the job very well."

The DW10 Tractor is all-"Caterpillar" built, with a smooth constant mesh transmission and heavy-duty clutch that's built to last. Its hydraulic power steering never loses the feel of the road. Turning radius is extremely short, only 37 feet nonstop. And synchronized braking holds the trail unit first, prevents jackknifing. The No. 10 Scraper's cable operation allows easy pumping of dead materials, positive ejection moves the stickiest load out in a hurry, and the big open bowl is an easy target for the shovel operators.

Your nearby "Caterpillar" Dealer can give you the whole story on this big, speedy yellow team.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

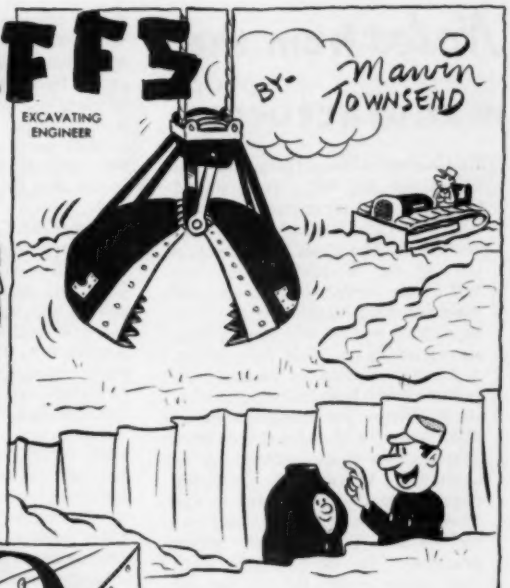
REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

EX-LAFFS

BY- Marvin TOWNSEND

"Well girls, it looks like we're all set for five o'clock."



"That's fine, now after he takes this bite, I'll scream and you go running out of the ditch waving your arms about."

"I hear there's a good ball game on in town today, Johnson-Johnson!"

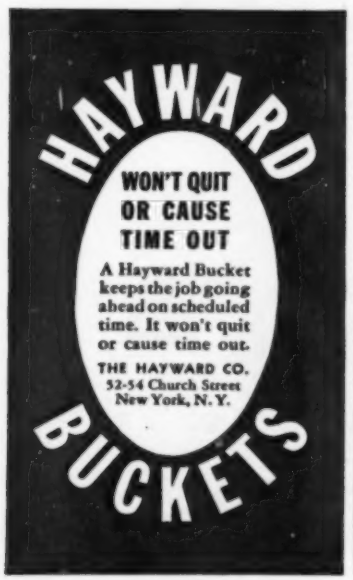
"Now to find out how far it is as the crow flies."

"I designed it myself for rootin' in the mud."

Notes from the manufacturers

Allis-Chalmers Manufacturing Co., Milwaukee 14, Wis., has acquired the plant and remaining assets of Victor Electric Products, Inc., Cincinnati, O. The plant will become a part of the Norwood Works and will house sales, engineering and manufacturing facilities of the Texrope drive section which have been carried on at the West Allis works. A limited number of management personnel will be transferred to Norwood. Victor previously produced small motors and motor driven fans. Manufacture of the motors will be continued. Victor had previously disposed of the fan business. The Texrope V-belt drive was developed by the late Walter Geist, former president. In 1926 textile mills were losing money through the use of old-fashioned flat belts which slipped, breaking the thin textile threads. Fabric was being spoiled by oil and grease dripping from the silent chain or gear drives. Geist developed the multiple V-belt drive which utilizes grooved sheaves and V-belts. This has since developed into an important industry.

American Brake Shoe Co., New York 17, N. Y., has started production at its new steel forging plant in Azusa, Calif. The AmForge Division of the company operates the plant which was purchased a few months ago from a steel fabricating company. Initial production at the Azusa plant will be 57 mm. and 75 mm. shells. Other ordnance material, aircraft parts and regular commercial forgings will be in production in the near future.



Bucyrus-Erie Co., South Milwaukee, Wis., announces the appointment of Brown-Bevis-Industrial Equipment Co., 4441 Santa Fe Ave., Los Angeles, Calif., as distributor for Bucyrus-Erie tractor equipment. The Los Angeles firm will serve tractor equipment users in Los Angeles and Orange Counties. Included in the Bucyrus-Erie tractor equipment line, which is designed and built for use with International industrial tractors, are 4-wheel scrapers, cable and hydraulic bulldozers and Bullgraders, Dozer-Shovels, rippers and grubbers, pusher plates, double drum rear-mounted and single drum front-mounted winches.

Caterpillar Tractor Co., Peoria, Ill., announces the appointment of Gale E. Allen as supervisor of Trackson products promotion. Trackson, which manufactures auxiliary products for Caterpillar equipment, is now a wholly owned subsidiary of Caterpillar. Allen, who was domestic sales manager for Trackson had been with that company since October 1942 and for four years prior to that was employed by Martin-Roasa Tractor & Equipment Co., Caterpillar distributor at Cedar Rapids, Ia. From 1929 to 1939, he held various positions with Caterpillar at Peoria including that of special representative in the sales department.

D. W. Onan & Sons Inc., Minneapolis, Minn. has appointed three new distributors to handle their line of electric generating equipment. The new distributor of the complete line in western Pennsylvania is the A. F. Shane Co. of 440 S. Evaline St., Pittsburgh. In St. Louis, Mo., the Koochook Co., Inc., has been named the distributor for eastern Missouri and southern Illinois. Formerly, Koochook Co. was an established Onan service and parts center. New distributor for Utah and eastern Idaho is Motor Mercantile Co., of Salt Lake City, U., a division of Strevell-Paterson Hardware Co.

Euclid Road Machinery Co., Cleveland, O., announces expanded sales and service facilities in the states of Wisconsin and Oklahoma with the appointment of two new distributors. Cunningham-Ortmayer Co. of Milwaukee is the new distributor for Wisconsin. Euclid will be represented in Oklahoma by the Butler-Sparks Equipment Co., with headquarters in Oklahoma City. Cunningham-Ortmayer maintans branches in Eau Claire and Green Bay. C. G. Ortmayer is president; H. J. Adams, executive vice president; and R. R. Kelbe, vice president. E. A. Butler and R. A. Sparks, who have been in the construction business in Oklahoma for many years, bought out another distributor and formed the Butler-Sparks firm in June, 1951. The firm also operates a branch in Tulsa.

Harnischfeger Corp., Milwaukee, Wis., announces the appointment of Al Hoehler as district manager of its Pittsburgh offices. Hoehler moves to Pittsburgh from Boston where he headed the office since 1938. Hoehler joined the firm in 1929 after his graduation from Purdue University. He served in hoist sales and export in Milwaukee until his transfer to the New York office in 1930 where he worked as a sales engineer. B. Pratte, a veteran of nearly twenty years with P&H has been appointed general sales manager. Pratte joined the firm as a sales trainee after graduation from Marquette University in April, 1933, and spent his first two and a half years in sales at the home office. From there he moved to the Pittsburgh office in 1935, becoming district manager in 1946. He served in that capacity until his recent transfer to Milwaukee to take up his position as general sales manager. In his new role, Pratte will direct domestic sales of all divisions, except welding products. He will be in charge of all domestic branch office operations, excluding the Pacific division, whose activities he will help coordinate with overall sales and service policy. Also, Pratte will assume jurisdiction over Milwaukee repair sales and service departments.

Hercules Steel Products Corp., Galion, O. has signed an agreement to manufacture the complete Willard line of portable concrete handling equipment for distribution in all states bordering on and east of the Mississippi River. The line consists of concrete mixers, weigh-batch loaders, and conveyors. Hercules is already in production on the 3 yd. concrete mixer and will soon begin manufacturing the 4½ and 5½ yd. mixers. The Willard Concrete Machinery Sales Co. is expanding their

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

Page 618 diesel walking dragline. 110 ft. boom, 5 cu. yd. bucket Machine approximately 7 years old. Good operating condition. $50,000. Loaded on cars. Location Middle East.
Box 3455

Page 625 diesel walking dragline. 150 ft. boom, 9 cu. yd. bucket, 4 years old. Good operating condition. Price $150,000. Loaded on cars. Location middle east. Box 3456

Bucyrus-Erie 75-B shovel in good operating condition. Recently completely overhauled. Priced right. Location West Coast.
Granite Rock Company
Watsonville, California

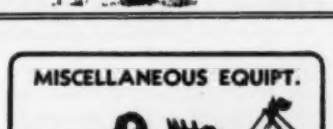
SHOVELS - CRANES - DRAGLINES
We specialize in used late model machinery of all types and sizes, including Northwest, Bucyrus-Erie, Koehring, Lima and Lorain units. All machinery in sound operating condition. Complete attachments for above available.
SALES Reasonable Prices RENTALS
J. C. French, 226 Berry Pkwy., Park Ridge, Ill. Tel. TAlcott 3-4927

Northwest model 25; 6; 30D; 95. Manitowoc 6560; 4500 new — will rent. Bucyrus 54-B; Monighan 5W; 7W; 9W; 450.
A. W. Nevers Phone 32 Mt. Pleasant, Iowa

May We Help You?
If you do not find the equipment you want listed in these columns, write to:
Excavating Engineer
South Milwaukee Wisconsin

Bucyrus-Erie 22-B. Equipped as clamshell and dragline with 50' boom, high A-frame, independent boom hoist, no drag bucket or clamshell bucket included. This machine has 26" treads and a D-11000 Caterpillar diesel engine with electric starter on the gasoline starting engine. Located in Norfolk, Va. Please contact:
Bemiss Equipment Corporation
Attn: Mr. W. C. Coleman
2219 Chamberlayne Avenue Richmond 22, Va.

Osgood Model 200 size ½-yd. shovel and crane including fairleads equipped with Buda gasoline engine. Machine Serial No. 3324.
Box 3483



Locomotives, 7 to 80 tons, diesel, gas (12). Gyratory crushers, 25A Telsmith; 27", 30" Nordberg-G.E. diesel-elec. generator, 875 KW. Whirley gantry cranes, Colby, Clyde, American. Dryers, kilns: 54"x40', 72"x47', 9'x10'x170'. Shovels, draglines, cranes, 1½-yd. to 10-yd. Walking draglines, 15W, 9W, 5T, diesel, elec. Floating derricks, 30 and 15 tons, steam. B-Erie shovel front att., 2½ yd., 52B-55B.
H. Y. Smith Co., 628 N. B'way, Milw. 2, Wis.

USED CONSTRUCTION EQUIPMENT
ALLIS-CHALMERS Model AD 75 HP motor grader.
CLEVELAND Model 110 trencher.
JAEGER 2-yd. Moto-Mixer, mounted on GMC truck.
NORTHWEST Model 25 diesel dragline.
CATERPILLAR Model D-8 tractor with LeTourneau cable tipdozer.
E. F. CRAVEN COMPANY
P. O. Box 538
Greensboro, North Carolina Phone 3-5321

PAVER BARGAIN

IMMEDIATE DELIVERY

MultiFoote Model 34-E
Dual Drum Concrete Paver

CURRENT MODEL
COMPLETELY REBUILT

Equipped with 35' boom, 60" bucket, electric starter, large water tank and pump. Hercules gas engine.

Price $24,000.00

H. O. PENN MACHINERY CO., INC.
140th Street & East River
New York 54, New York
Tel. CYpress 2-4800

Backhoe boom stick and bucket for 420 General. 99% condition.
Riemer Bros., Inc.
6301 Fletcher St. Chicago 34, Illinois

USED EQUIPMENT
BUCYRUS-ERIE Model 5-90, 4-wheel 8 to 10 yd. scraper.
ALLIS-CHALMERS Model HD-14C tractor with Gar Wood hydraulic control unit.
ALLIS-CHALMERS Model AD motor grader powered by a GM 3-cylinder engine.
CATERPILLAR Model D-8 tractor with LeTourneau cable tip dozer.
For further information, contact
E. F. CRAVEN COMPANY
Phone 3-5321 P.O. Box 538
Greensboro, N. C.

3—Buda HP-326 gasoline engines, 6 cylinder, 3-13/16" x 4¾", Governor set @ 1600 R.P.M., complete with fittings. Bargain price $650 F.O.B. South Milwaukee, Wisconsin.
Bucyrus-Erie Company
South Milwaukee Wisconsin

1949 KB-8 International 6 wheeler cab and chassis with 900 x 20 tires; with or without dumpbody. Very reasonable.
Riemer Bros. Inc., 6301 Fletcher St., Chicago 34, Ill., NAtional 2-3636

5
HEILINERS
at a RIGHT Price

Tractor Model 2C800 with 200 HP Cummins Diesel Engines Scrapers Model C16—Cap. 13.1 struck to 16 heaped. Brand new tires 24.00 x 29-24 ply. Five units available—all in excellent condition.

Price Each $20,500.00

also

4 EUCLID
BOTTOM DUMP WAGONS

Model 25FDT Capacity 13 to 17 cu. yds. with 165 HP Cummins Diesel Engines. Reconditioned, ready to roll,

Price Each $12,500.00

H. O. PENN MACHINERY CO., INC.
140th St. & East River
New York 54, New York
CYpress 2-4800

POSITIONS WANTED

Position wanted as shovel, dragline, clamshell or pile driver operator. Have operated gas, steam and diesel large and small machines. Prefer steady work. P. O. Box 8, Hurricane, West Virginia. Phone 4403-Hurricane.

General superintendent or superintendent available; 30 years experience and qualifications; supervising, estimating, and building all types highways, airports, heavy excavating, large sewers, earth-filled dams, levies, covering several states. Honest, sober, and reliable, know cost and equipment. Interpret plans and organising.
Box 3464

distributor organization in the territory which will be supplied from the Hercules plant.

Frank G. Hough Co., Libertyville, Ill., announces the assignment of two new district representatives replacing Jim Suter who has become associated with Cornhusker Tractor and Equipment Co., North Platte, Nebr. The new men, Dan Daily and Dick Lewis, recently completed a rigorous sales training program and will work with distributors in the application of tractor shovels and tractors. Daily will headquarter at Minneapolis and cover sales district 4, comprising the states of North and South Dakota, Minnesota, Iowa, Wisconsin and upper Michigan. He is a mechanical engineering graduate of the University of Minnesota. Dick Lewis will headquarter at Kansas City, Mo., and cover sales district 5, comprising western Missouri, Wyoming, Nebraska, Kansas and Colorado.

Joy Manufacturing Co., Pittsburgh 22, Pa. has appointed McNall Machinery & Supply Corp. distributor of Joy construction equipment for a major portion of the state of Iowa and part of Illinois. The McNall firm maintains sales and service facilities at 600 D Ave. Northwest, Cedar Rapids, Ia. This representation covers the entire Joy construction line including air compressors, wagon drills, hand-held drills, paving breakers, spaders, tampers, and portable hoists.

Kingston Trap Rock Co., Kingston, N. J., announced the appointments of Harvey S. Moore, Jr. as full-time attorney and Joseph N. McGowan as sales engineer. Moore, a Trenton attorney, joins the company staff at the Kingston offices. McGowan has been assigned as sales engineer for the Pennington Quarry Co., new central mix concrete plant at Pennington. The firm annually quarries 1.8 million tons of trap rock from 755 acres of quarries at Kingston, Pennington and Lambertville. Moore received his Bachelor of Arts degree from Duke University and his Bachelor of Laws degree from the Duke School of Law in 1939. He was admitted to the New Jersey bar in 1942. After entering the Army that year, Moore saw service in the Southwest Pacific and the Philippines and attained the rank of first lieutenant. McGowan attended Seton Hall University for two years and was graduated in February, 1952 from the Wharton School of Finance and Commerce, University of Pennsylvania. During World War II, McGowan served with the Navy in the Pacific.

A. Leschen & Sons Rope Co., St. Louis 12, Mo., has changed the address of its Los Angeles office and warehouse. Formerly at 2439 Hunter St., it is now located at 2871 East Pico Blvd. The new location provides increased facilities for prompt shipment of wire rope from stock.

Macwhyte Co., Kenosha, Wis., producer of wire, wire rope and slings, announces the appointment of Archie M. Naysmith as general superintendent and plant engineer. Naysmith came to Macwhyte Co. 24 years ago from Scotland, where he had been 12 years with Bruntons Ltd., Musselburgh, Scotland, manufacturers of wire and wire rope. R. B. Whyte, Jr., has been appointed assistant general superintendent and assistant plant engineer. The office of general superintendent is new, formerly a part of the office of Mr. R. B. Whyte, Sr., V.P., in charge of operations.

Olin Industries, Inc., East Alton, Ill., has acquired Ramset Fasteners, Inc. of Cleveland, O., one of the country's oldest manufacturers of powder-actuated industrial tools. Ramset is a pioneer of new developments in the field of explosive-powered tools for driving steel studs into concrete, brick, or steel. The stud-driving tools are powered by a special type of smokeless powder cartridge. Ramset Fasteners, Inc., will continue its business under its present management and will be operated by Jesse E. Williams, its president, as a part of the arms and ammunition division of Olin Industries.

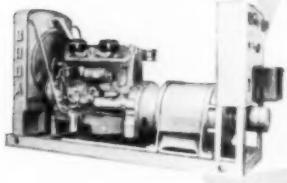
Stewart-Warner Corp., Chicago 14, Ill., has purchased substantial stock interest in Uni-Gun Lubricating Equipment, Ltd., of London, England, a company which presently manufactures a limited line of products similar to Stewart-Warner's Alemite lubrication equipment line. Along with its stock interest Stewart-Warner will have operating control. Stewart-Warner intends to expand operations of the English company, for the purpose of furthering the distribution of Alemite and Uni-Gun products not only in Great Britain but in the world markets. Uni-Gun Lubricating Equipment, Ltd. will have access to all Alemite designs and developments.

A WEIGHT LIFTING CHAMP
No matter what size Omaha bucket you choose, you'll find a champion weight lifter. There's extra strength for the tough digging job—surplus weight eliminated; a bigger payload built in. Omaha buckets fill quicker, dump cleaner and stand up better on every job. Available in four types.
Write today for catalog giving complete description and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

BUDA DIESELS

MONEY MAKERS IN YOUR SHOVELS AND DRAGLINES...

EQUALLY PROFITABLE IN ALL YOUR OTHER EQUIPMENT



When leading Shovel and Dragline builders pick Buda Diesels to power their equipment they choose them for good reasons: —longer life, lower operating cost—minimum maintenance . . . more power . . . greater torque . . . extensive parts & service.

These same money-making advantages of Buda Diesels can be applied to almost every other piece of construction equipment you own. Don't miss a chance to repower with Buda Diesels . . . they're designed with your profits in mind.

Facts and performance sell Buda Diesels. Get full details from your nearby Buda Distributor today. Write for Bulletin. *The Buda Company, Harvey, Illinois*

BUDA

There's a Buda Diesel for Every Need

BC-23

Manufacturers of Material Handling Equipment, Lifting Jacks, Maintenance of Way Products, Earth Drills and Diesel and Gasoline Engines

WIRE ROPE

This is the most economical rope we've ever made for excavating and construction

ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope maker in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the best choice for efficiency and long life on excavating and construction equipment. This rope has *extra* resistance to crushing and abrasion . . . stands up under rough going. It saves you time and cuts costs.

There's a Roebling wire rope for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 701 ST. CLAIR AVE, N. E. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.